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ABSTRACT

A study was done to explore the feasibility of developing a set of activity preference (interest) scales corresponding to twenty-two second (higher) order work dimensions derived from the Occupation Analysis Inventory (OAI). (The OAI is an instrument containing 622 work elements which are descriptions of work activities and conditions on which jobs and occupations are rated.) A twenty-two scale Vocational Activity Preference Profile (VAPP-1) was developed which was comprised of activity preference items based on the activities defining the twenty-two second order work dimensions. After initial evaluation and revision, VAPP-1 was administered to a sample of 100 undergraduate students. Based on an analysis of data from the VAPP-1 administration, VAPP-2 consisting of twenty-one scales was constructed and administered to over 500 public school students in grades 9 through 12. Statistical analyses of the resultant data showed substantial item and scale reliabilities, and produced seven interpretable and reasonably stable factors. The results indicated that an ergometric approach to interest measurement was feasible. (The appendix contains twelve of the thirty data tables included in the report along with definitions of the twenty-two interest scales, examples of scale items, instructions and response formats for VAPP-1 and 2, scale description booklet and participant report form and factor analyses of the VAPP-2 scales.) (Author/EM)

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THE DEVELOPMENT OF ACTIVITY PREFERENCE SCALES BASED ON SYSTEMATICALLY DERIVED WORK DIMENSIONS: AN ERGOMETRIC APPROACH TO INTEREST MEASUREMENT

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Report No. 15 of the Ergometric Research and Development Series

Program Director: J. W. Cunningham

CENTER FOR OCCUPATIONAL EDUCATION
North Carolina State University at Raleigh

1975

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J. W. Cunningham, Program Director

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Two basic premises underlie the TESAAS Program:

(1) If the avowed purpose of education is to prepare the individual for a meaningful role in adult society, then we must establish relationships between the activities and conditions to which the student is exposed in the educational setting and those which he/she is likely to encounter upon leaving that environment.

(2) There is an established technology, "ergometrics" (or quantitative activity analysis), that can be used in gathering and organizing information about the domain of adult activities for educational development purposes.

ADDITIONAL INFORMATION

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ABSTRACT

This study explored the feasibility of developing vocational activity preference (interest) scales corresponding to 22 general work dimensions derived through systematic job analysis with the Occupation Analysis Inventory (OAI). The first phase of this effort involved the construction of activity preference items based on the activities defining the 22 OAI work dimensions. The resultant items comprised the 22 scales in the initial form of the Vocational Activity Preference Profile (VAPP-1). After initial evaluation and revision, the items were administered to a sample of 100 undergraduate students and item/scale statistics were computed. The Ohio Vocational Interest Survey (OVIS) was administered to the same sample of students, and the VAPP-1 scales were correlated with judgmentally related OVIS scales; substantial correlations were obtained. Based on the item/scale statistics from the VAPP-1, the original items were selected, eliminated, or revised, and compiled into a VAPP-2 consisting of 21 scales of 10 items each. The VAPP-2 was then administered to over 500 public school students in grades 9 through 12, and the resultant data were used in further item/scale analyses. The results showed substantial item and scale reliabilities, but sizable correlations among the scales. A factor analysis of the 21 scales produced seven interpretable and reasonably stable factors; and a hierarchical cluster analysis of the scales yielded meaningful scale clusters, six of which were given the same interpretations as six of the VAPP factors. Interestingly, five of the VAPP factors and matching clusters appeared to correspond rather closely with Holland's six occupationally related personality types. The results as a whole were interpreted as supporting the feasibility of an ergometric approach to interest measurement. It is believed that with further development, the VAPP could prove useful in relating students' activity preferences to the activities associated with the occupations and occupational clusters in an OAI-based taxonomy.

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INTRODUCTION

This report is part of the Ergometric Series dealing with the development of a quantitative system for describing and structuring the world of work for educational purposes. In earlier papers (Cunningham, 1971; Cunningham, Tuttle, Floyd, and Bates, 1971), it was proposed that systematically derived dimensions representing different types of work activities could serve at least two purposes:

(1) Such dimensions could provide a quantitative basis for the description, comparison, and classification of jobs and occupations.

(2) They could serve as variables for the measurement of work related behavioral potentials (e.g., abilities and interests) of people.

Pursuant to those purposes, the staff of the Ergometric Project at North Carolina State University's Center for Occupational Education have been engaged during the past several years in the derivation and validation of a comprehensive set of work dimensions based on the Occupation Analysis Inventory, or OAI (Cunningham et al., 1971). The OAI work dimensions are currently being used in the development of a quantitative occupational taxonomy (Riccobono, Cunningham, and Boese, 1975; Pass and Cunningham, 1975).

The present study involved an attempt to develop a set of activity preference (interest) scales based on selected OAI work dimensions. It was reasoned that measures of students' activity preferences on those dimensions would provide a direct means of relating the students' interests to the characteristics and requirements of the occupations and occupational clusters in the OAI-based taxonomy.

Background of the Study

The Ergometric Project began with the development of an Occupation Analysis Inventory (OAI) containing 622 "work elements" (descriptions of different kinds of work activities and conditions) on which jobs and occupations are rated (Cunningham et al., 1971). The OAI work elements were generated within the broad framework of an information-processing paradigm (see Figure 1) whose components were subdivided according to selected conceptual frameworks pertaining to human behavior and work technology; the work elements were constructed within the resultant subcategories. The completed instrument represented an attempt to achieve as much specificity (or content loading) in occupational description as possible, while retaining applicability to the entire occupational spectrum. The OAI was thus conceived as ". . . an instrument which pushes the limits of general applicability; that is,

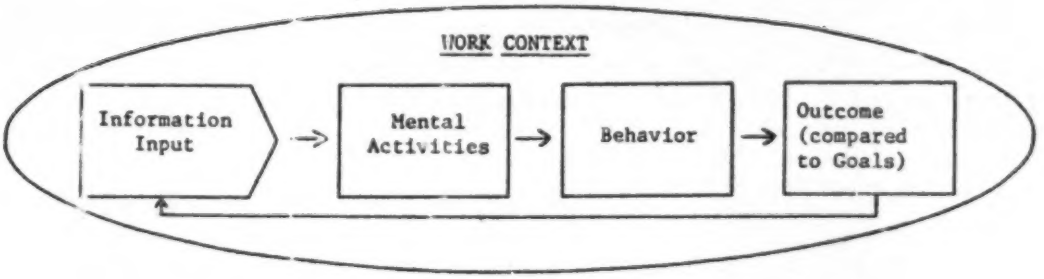

Figure 1. Paradigm of the Occupation Analysis Inventory (OAI)

an instrument that falls near a specificity-generality threshold separating general descriptive devices from devices designed for restricted categories of jobs and occupations" (Cunningham et al., 1971, p. 5).

Since the OAI was designed to analyze and describe jobs in terms relevant to human behavior, it was considered both desirable and feasible (in terms of existing technology) to link the OAI work elements to defined human attributes in the cognitive, psychomotor, and affective domains (i.e., to selected abilities, interests, and needs). Accordingly, the investigators identified and defined 103 human attributes for which there were existing tests or inventories in the three domains. Estimated requirements were then established for each OAI work element on each of the 103 human attributes, according to the job-component (or synthetic validity) procedure developed by E. J. McCormick at Purdue University (McCormick, Cunningham, and Thornton, 1967; McCormick, Jeanneret, and Mecham, 1972; Pass and Cunningham, 1975; Neeb, Cunningham, and Pass, 1971). The derived linkages between the OAI work elements and the 103 measurable human attributes expanded the capacity of the OAI; based on those linkages, the OAI could provide estimates of a job's requirements for the various human attributes, as well as a description of the activities and conditions (in terms of work elements and dimensions) involved in the job. It is believed that the OAI-based attribute-requirement profiles for jobs and occupations could prove useful in the vocational guidance setting, since it should be feasible to relate a student's test-score profile to the corresponding attribute-requirement profiles of jobs, occupations, and occupational clusters.

The next phase of the Ergometric Project involved rating large, representative samples of jobs on the OAI. In a series of three studies

(Riccobono and Cunningham, 1971a, 1971b; Boese and Cunningham, 1975), a total of 1414 jobs was rated on the OAI by professional job analysts and graduate students in psychology using written job descriptions (USES job schedules) obtained from the files of the U. S. Employment Service's Occupational Field Center located in Raleigh, North Carolina. In the last of the three studies, eight separate a priori sections of OAI work elements were each subjected to a factor analysis based on the 1414 job ratings. Those eight separate analyses produced a total of 132 first-order factors, or work dimensions, representing basic types of work activities or conditions within their respective OAI sections. For the purpose of combining all sections of OAI elements, 128 of the first-order factors were, in turn, subjected to a factor analysis which yielded 28 orthogonal higher-order factors. In general, both the first- and higher-order factors were meaningful and stable (as determined by Tucker's coefficient of congruence).

During the course of the Ergometric Project, four studies have been conducted to test the construct validity of the two sets of variables derived from the OAI, i.e., the work dimensions (factors) and attribute-requirement estimates (Augustin, Cunningham, and Heath, 1975; Bates and Cunningham, in press; Heath, Cunningham, and Augustin, 1975; Tuttle and Cunningham, 1972). In those studies, it was reasoned that if the OAI variables were actually relevant to work-related human behavior then it should be possible to demonstrate statistically significant relationships between those variables and the behavioral potentials measured by selected tests and inventories. In combination, the four studies have, in fact, shown significant relationships between (a) the OAI work-dimension scores and attribute-requirement estimates for several samples of occupations and (b) the ability, interest, need, and satisfaction scores of incumbents or graduate trainees in those same occupations. Based on the studies conducted to date, it seems reasonable to conclude that the OAI variables are meaningful, reliable, construct valid (within the limits of the aforementioned studies), and potentially useful in educational development.

One of the major reasons for the development of the OAI and the derivation of the aforementioned occupational variables was to provide a systematic, quantitative basis for describing, comparing, and grouping jobs and occupations for educational purposes; i.e., to develop an occupational taxonomy geared to educational needs. In that regard, it was noted that although some other fields (most notably biology) have invested considerable time and effort in quantitative taxonomy development, the area of work and occupational taxonomy is relatively undeveloped, especially in relation to educational needs (Cunningham, 1971). Thus, it was proposed that the OAI work dimensions be used to derive an occupational cluster structure that would provide at least a crude framework for occupational guidance and other educationally related purposes, e.g., the development of occupational exploration curricula and possibly some

broad occupational preparation curricula.[1] Pursuant to that objective, a sequence of two studies was conducted, both involving the clustering of jobs based on similarities in their OAI work-dimension profiles (Riccobono, Cunningham, and Boese, 1975; Pass and Cunningham, 1975). Several sets of clusters were derived through the application of a hierarchical procedure (Christal, 1970; Ward and Hook, 1963) to alternative combinations of work dimensions and different types of profile similarity indices. The final (best) occupational cluster structure was based upon the intercorrelations of the first-order work dimension (factor) score profiles of 1414 jobs. It consists of 21 rather broad, "macro," clusters which, in turn, subsume a larger number of narrower, "micro," clusters (Pass and Cunningham, 1975). In their discussion of this OAI-based cluster structure, Pass and Cunningham concluded that it was readily interpretable and should provide a reasonable framework for the development of an occupational information system for use in guidance. It was also noted that the derivation of a stable, meaningful cluster structure based on the OAI work dimensions provides further support for the construct validity of those variables.

Purpose of the Study

As mentioned previously, the OAI work dimensions were also intended to serve as bases for the development of occupationally related tests and inventories. In accordance with that intent, the present study involved the exploratory development of a set of activity preference (interest) scales corresponding to 22 of the second-order work dimensions (factors) derived from the OAI. It was reasoned that such scales would provide a direct basis for relating students' interests to the characteristics and requirements of the occupations and occupational clusters in the OAI taxonomy, since those occupations and clusters can be characterized in terms of the same 22 dimensions.

The specific objectives of the study were to:

(1) select the OAI second-order work dimensions that provided appropriate bases for interest scales and develop specifications for the scales,

(2) construct items for each scale corresponding to the OAI work elements involved in the scale's work dimension,

(3) screen the items for clarity and readability,

(4) analyze the items for congruence with their intended scales,

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[1]At the same time, it was noted that the development of a comprehensive, detailed quantitative taxonomy of work and occupations would require the systematic efforts of many researchers over a period of years.

(5) analyze the total scale scores for internal consistency reliability,

(6) determine the extent of inter-dependence among the scales,

(7) conduct a pilot construct validity analysis of the relationships between the new scales and the scales from an existing interest inventory (the Ohio Vocational Interest Survey).

Based on an examination of the results obtained under objective 6, it was also decided that the OAI-based scales would be subjected to factor and cluster analyses.

PROCEDURES AND RESULTS

The study involved four phases: (1) the development of interest scale descriptions and an initial item pool representing the scales; (2) the initial evaluation and revision of the item pool; (3) the administration of the first version of the Vocational Activity Preference Profile (VAPP-1) to a sample of undergraduates and analysis of the data; and (4) the administration of a revised form of the Vocational Activity Preference Profile (VAPP-2) to a sample of ninth-through-twelfth-grade public school students and subsequent data analyses. The procedures and results are reported according to the four project phases.

Development of the Initial Scale Descriptions and Item Pool

As mentioned previously, 28 general work dimensions (higher-order factors) were derived through a second-order factor analysis of the Occupation Analysis Inventory (Boese and Cunningham, 1975). Of these 28 dimensions, 22 were judged to be sufficiently meaningful to serve initially as bases for the development of occupational interest scales. The titles of the 22 selected OAI work dimensions were as follows:

1 Agronomy
2 Animal Care and Training
3 Assembly
4 Chemical Activities
5 Clerical Activities
6 Construction
7 Customer Sales and Service
8 Electrical and Electronic Assembly and Maintenance
9 Food Preparation
10 Human Assessment and Interpersonal Relations
11 Ideational Activities
12 Instruction
13 Mechanical and Structural Drawing
14 Mechanical Maintenance
15 Medical and Related Activities
16 Navigation and Navigational Communications
17 Operation of Vehicles and Mechanized Equipment
18 Performing Arts
19 Physical Coordination and Rush Situations
20 Supervision and Organization of Work
21 Utilization of Numerical Data
22 Visual Arts

A one-page description was written for each of the forenamed work dimensions based on information obtained from the Boese and Cunningham study. These descriptions are contained in Appendix A.

From 13 to 18 interest items were written initially for each of the 22 OAI work dimensions (higher-order factors). These items were based on the OAI work elements (job-rating items) that were most heavily involved in the second-order factor in question. The item writing task was assigned to two psychology doctoral students (graduate research assistants), each of whom worked independently on 11 scales. In all cases, the items consisted of work activity statements, as opposed to occupational titles, recreational activities, hobbies, or school interests. Examples of the items written for each of the 22 scales are shown in Appendix B.

Initial Item Evaluation and Revision

After completing the initial sets of items for their assigned scales, the two item writers reviewed each other's items and collaborated in improving the readability, concreteness, and representativeness of the items. The writers used Taylor et al.'s (1969) A Revised Core Vocabulary: A Basic Vocabulary for Grades 1-8, An Advanced Vocabulary for Grades 9-13 as a guide for screening words in order to limit the items to an eighth-grade reading level. Following the item revisions based on writer collaboration, further revisions were made in response to item reviews by the project director and an outside consultant. In making revisions, the item writers were careful to maintain the prescribed grade limit on reading level and to preserve the items' relevance to the appropriate OAI work elements and dimensions.

Student Interviews and Related Item Revision

At that stage in the instrument development, it was decided to obtain student reactions to the interest items. For that purpose, an initial group of 24 students was selected from grades 9 through 12 in two local schools: six students represented each of the four grades; 12 students were males and 12 were females; 6 students were black and 18 were white. The selected students were average or below average in academic ability and achievement as indicated by their recorded grades and standardized test scores.

Each student was interviewed individually by one of the item writers. During the interview, the student was asked to read each item carefully, identify words that could not be read or understood, and indicate whether or not the meaning of the item was clear. In addition, the student was queried regarding specific points on certain items that were suspected of being difficult to conceptualize or otherwise troublesome. The interviewer wrote down relevant student comments for each item.

Upon completion of the 24 interviews, the recorded student comments were compiled for each item, and a tabulation was made showing the number of times each item presented a problem to a student. The

resulting information provided the basis for a third effort at item revision involving the modification of every item that encountered more than one legitimate student complaint.

The third revision items were then shown to a second sample of 24 students with characteristics similar to those described for the first sample. Again, the item writers interviewed students individually, following the procedures outlined for the first sample, and student comments were recorded and compiled as previously described.

Based on the information obtained from the second sample of students, the item writers next rated each item on a five-point scale of readability for which a value of "5" represented no reading or comprehension problem for any student and a value of "1" indicated serious comprehension problems for a large number of students. The resultant item ratings are shown in Appendix C (Table 19). All items with a readability rating of less than four (a total of 44 items) were subsequently modified in a fourth item revision effort.

Rater Evaluation of Items and Related Item Revision

Following the fourth item revision, ten judges (advanced graduate students in psychology, guidance, and occupational education) were assigned the task of sorting all 341 items into the 22 interest scale categories. For that purpose, each item was typed individually on a 3 X 5 index card and given to the judges void of any identification regarding the scale for which it was intended. In addition, the judges were given a one-page written description of each of the 22 scales (see Appendix A). Each judge worked independently in sorting the item cards into the categories he/she judged to be appropriate.

It was reasoned that an item which was not consistently sorted into its appropriate scale would probably inadequately represent that scale in an interest inventory. Accordingly, it was decided that all items receiving less than eight correct assignments would either be revised or removed from the item pool. As shown in Appendix C, Table 19. 56 items did not meet the criterion of eight correct scale assignments. Also shown in Appendix C (Table 20) are data concerning the misassignments of items to scales.

Approximately one week after the item sorting was completed, nine of the original ten judges were again presented the interest items and scale descriptions and were asked to rate each item on a six-point scale in terms of "its closeness of fit" with its intended interest scale. Each judge was given a list containing every item and the scale number for which it was written, along with instructions to begin with the first interest scale and rate every item associated with that scale before proceeding to the next scale. The items for all 22 scales (a total of 341 items) were rated independently by each of the nine judges. The rating scale, instructions, and mean item ratings are shown in Appendix C. It was decided that any item with a mean congruence (or "closeness

of fit") rating of less than 4.00 would be revised or eliminated. A total of 33 items received a mean rating of less than 4.00.

Table 1 summarizes the results of the item readability ratings by the item writers and the item-scale sorts and item-scale congruence ratings by the judges. Presented in Table 1 for each scale are: (a) the total number of items, (b) the number of items that did not meet all three of the previously mentioned criteria (i.e., for readability, sort consistency, and congruence rating), and (c) the number and percentage of items that met all three criteria and were thus considered to be satisfactory. Any item that did not meet all three of the criteria was either eliminated or revised, depending upon the total number of satisfactory items for the scale in question. With certain exceptions, the following general rules were followed in retaining items for further use in the study:

(a) If a scale had more than 12 satisfactory items in relation to the three criteria, the 12 items with the highest criterion values were retained.

(b) If a scale had less than 10 satisfactory items, unsatisfactory items with the highest criterion values were revised and pooled with the satisfactory items in order to provide a total of 10 usable items for the scale.

(c) If a scale had 10 to 12 satisfactory items, all such items were retained.

The exceptions to the preceding rules included: Scales 11 and 21, each of which retained two more items than allowed by the rules, based on the investigators' judgment and the item-scale sorts of the most accurate judge; Scales 7 and 15, which each retained 13 rather than 12 items (i.e., one additional item each) because of their exceptionally high item criterion values; and (c) Scales 1, 4, and 19, which each lost one legitimate item through clerical error. A total of 240 satisfactory and revised items was retained for subsequent use in the study.

Administration and Analysis of the Initial Form of the Vocational Activity Preference Profile (VAPP-1)

The 240 items selected from the previously described analyses were compiled into an initial form of the Vocational Activity Preference Profile (VAPP-1). The position of each item in the inventory was determined as follows: (1) the first item in each of the 22 scales was given an identification number, 1 through 22, and the 22 identification numbers were randomly assigned to the first 22 positions in the inventory; (2) next, the second item in each of the 22 scales was randomly assigned to an inventory position, 23 to 44, following the aforementioned

Table 1

Number of Unsatisfactory Items and Number and Percentage of Satisfactory Items for Each VAPP Scale

Scale Number	Total Number of Items	Number of Unsatisfactory Items	Number of Satisfactory Items	Percentage of Satisfactory Items
1	18	7	11	61
2	15	2	13	87
3	15	7	8	60
4	16	4	12	75
5	17	5	12	71
6	14	5	9	64
7	15	1	14	93
8	15	6	9	60
9	16	1	15	94
10	16	6	10	63
11	16	7	9	50
12	16	6	10	63
13	18	12	6	22
14	14	3	11	79
15	16	1	15	94
16	13	5	8	62
17	13	3	10	77
18	15	3	12	80
19	14	3	11	79
20	15	6	9	60
21	18	9	9	50
22	16	4	12	75

procedures; (3) the same procedure was applied with successive blocks of inventory positions until all 240 items in the pool were assigned to positions.

A three-response format was devised for use with VAPP-1 requiring the respondent to indicate whether he/she would "Like," "Not Like," or had "No Opinion" regarding the activity in question. The instructions and response format for the VAPP-1 are shown in Appendix D.

Administration of the VAPP-1 to Undergraduate Students

The most immediately available subjects from whom initial item statistics could be obtained were undergraduate students enrolled at the university where the project was located.[2] Accordingly, the VAPP-1 was administered to 100 students enrolled in undergraduate psychology courses during a summer session. Forty-five of the students were females and 55 were males. In addition to the VAPP-1, each student completed the Ohio Vocational Interest Survey (OVIS) during the same testing session. Half of the students were administered the VAPP-1 first, and the remaining half were administered the OVIS first. The students recorded their VAPP-1 responses on Optical Scanning Corporation Form DS 1120-A standard answer sheets and their OVIS responses on standard OVIS answer sheets. For the VAPP-1, the first 160 item responses were recorded on one answer sheet and the remaining 80 responses on a second sheet. Subjects were tested in groups, and five testing sessions were required to process a total of 100 students.

Item and Scale Statistics for the VAPP-1

Each answer sheet was electronically scored by an Optical Scanning Corporation Model 100 reader, and the response data were recorded on magnetic tape. All data analyses were performed with an IBM Model 370/165 computer.

For scoring purposes, a "Not Like" response was assigned a value of "1," a "No Opinion" response a value of "2," and a "Like" response a value of "3." The response distribution and mean response value for each VAPP-1 item are shown in Appendix E. Items receiving 85 percent or more "Like" or "Not Like" responses were considered to be either too popular or unpopular for sufficient discrimination and were therefore eliminated. On that basis, three items were too popular and one too unpopular. Those items and their response percentages are shown in Table 2.

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[2]That point in the project was reached in mid-June, when the public schools were closed. Although public school students were the target population for the final form of the VAPP, it was decided that a sample of undergraduate college students would provide adequate statistics for the purpose of initial item screening.

Table 2

Very Popular and Very Unpopular Interest Items in the VAPP-1

Item No.	Interest Item	Percent "LIKE" or "NOT LIKE"
8	Think up new, clever, or creative ideas.	86% L
97	Put ideas into words quickly and easily.	85% L
131	Operate a large dishwasher in a cafeteria.	88% NL
137	Express thoughts so that others can understand them correctly.	87% L

A subject's score on each interest scale was computed by summing his/her response values (1, 2, or 3) for all the items representing the scale. Table 3 presents the means, standard deviations, and mean percentages of maximum possible scale scores for the 100 subjects on the 22 VAPP-1 scales. The maximum possible score was computed for each scale by multiplying the number of items in the scale by three (the value for the "Like" response); the percentage of the maximum score was computed for each subject by dividing the subject's obtained scale score by the maximum possible scale score. The mean percentage of the maximum possible scale score serves as an index of scale popularity. In order to discriminate among vocational activity preferences, the investigators believed it would be desirable if the scale popularity values fell within the approximate range of 35 to 65 percent of the maximum scale scores. As shown in Table 3, the scale popularity index ranged from a low of 25 percent for Clerical Activities to a high of 85 percent for Ideational Activities; the index fell outside the desired range for six of the 22 interest scales. Among those six scales, in addition to Clerical Activities and Ideational Activities, were Food Preparation (28 percent), Human Assessment and Interpersonal Relations (80 percent), Instruction (71 percent), and Visual Arts (71 percent).

The next step in item analysis involved correlating the responses to each item with the total scores for the item's intended scale, i.e., Pearson correlation coefficients were computed between all items and their parent scales. Both the corrected and uncorrected correlations were computed. As a correction for an item's contribution to its total parent scale score, the subjects' responses to each item were subtracted from their total scale scores before that item was correlated with its parent scale. For the uncorrected item-scale correlations, responses to the items in question were included in their total parent scale scores. The correlations of every item with its corrected intended scale are

Table 3

Means, Standard Deviations, and Mean Percentages of Maximum Possible Scale Scores for 22 Interest Scales Based on VAPP-1 Data

Scale Number and Title	Mean Scale Score	Standard Deviation	Number of Items Per Scale	Mean Percentage of Maximum Scale Score
1. Agronomy	20.4	5.94	10	52
2. Animal Care and Training	24.0	8.05	12	50
3. Assembly	17.8	5.39	10	39
4. Chemical Activities	20.9	7.03	11	45
5. Clerical Activities	18.0	5.58	12	25
6. Construction	18.8	5.36	10	44
7. Customer Sales and Service	22.6	6.26	13	37
8. Electrical and Electronic Assembly and Maintenance	18.4	6.16	10	42
9. Food Preparation	18.7	5.36	12	28
10. Human Assessment and Interpersonal Relations	26.0	5.06	10	80
11. Ideational Activities	29.7	3.95	11	85
12. Instruction	24.2	4.41	10	71
13. Mechanical and Structural Drawing	19.0	6.01	10	45
14. Mechanical Maintenance	20.7	7.11	11	44
15. Medical and Related Activities	29.4	7.57	13	63
16. Navigation and Navigational Communications	20.8	5.58	10	54
17. Operation of Vehicles and Mechanized Equipment	19.8	5.59	10	49
18. Performing Arts	20.8	6.69	12	46
19. Physical Coordination and Rush Situations	22.8	3.62	10	64
20. Supervision and Organization of Work	21.8	5.34	10	59
21. Utilization of Numerical Data	20.7	5.86	11	44
22. Visual Arts	19.0	5.78	12	71

NOTE -- The maximum possible scale score equalled three times the number of items in the scale; the minimum possible scale score equalled the number of items in the scale.

shown in Appendix F, and the median corrected item-scale correlations for the 22 scales are shown in Table 4. The corrected item-scale correlations ranged from a low of +.08 (between the item "Sew garment pieces together to make clothing" and its intended scale, Assembly) to a high of +.91 (between the item "Find out why electrical devices fail to work properly" and its scale, Electrical and Electronic Assembly and Maintenance). The median corrected item-scale correlations within the 22 scales ranged from +.38 for the Physical Coordination and Rush Situations scale to +.82 for the Mechanical Maintenance scale.

In addition to the correlations between all items and their parent scales, correlations were computed between every item and the remaining 21 scales (i.e., scales for which the items were not intended) for the purpose of determining whether the items correlated most highly with their intended scales. Appendix G (Table 23) presents the item-scale correlations for the 15 items whose correlations with unintended scales exceeded the correlations with their corrected parent scales.

The reliabilities of the total scale scores were estimated by an analysis-of-variance procedure described by Winer (1971, pp. 291-297). Table 5 presents the unadjusted and adjusted reliability coefficients for scores on the 22 VAPP-1 scales. Essentially, an unadjusted coefficient estimates the correlation between a set of scores on a scale and a hypothetical comparable set of scale scores based on the same number of similar items, i.e., the coefficient that might be obtained if the 100 subjects' scores on the scale in question were correlated with their scores on an equivalent scale containing the same number of items. An adjusted coefficient estimates the correlation between the scale in question and a hypothetical comparable scale if all of the items contributing to the scales had the same average response value, or if the responses for each item were standardized before being summed into the total scale score. For purposes of the present study, the unadjusted coefficient offers the more reasonable estimate of scale reliability, since raw item responses were summed to obtain scale scores. As shown in Table 5, the values of the unadjusted coefficients ranged from a low of .50 for Scale 19 (Physical Coordination and Rush Situations) to a high of .95 for Scale 8 (Electrical and Electronic Assembly and Maintenance). With the exception of Scales 19 and 20, all scales had unadjusted coefficients of .80 or higher.

The Pearson correlations among the scores on all 22 VAPP-1 interest scales are presented in Appendix H. Those inter-scale correlations ranged from a low of -.30 between Scales 8 and 10 (Electrical and Electronic Assembly and Maintenance--Human Assessment and Interpersonal Relations) to a high of +.90 between Scales 8 and 14 (Electrical and Electronic Assembly and Maintenance--Mechanical Maintenance). The median correlation was +.22. Table 6 presents the frequency and percentage distributions for the 231 correlations among the 22 scales. That 17 of the correlations were higher than .59 indicates some lack of independence among the scales for students enrolled in undergraduate psychology courses.

Table 4

Median Correlations Between VAPP-1 Items and Their Intended Scales (n = 100)

	Scale Title	Number of Items	Median r
1.	Agronomy	10	.66
2.	Animal Care and Training	12	.76
3.	Assembly	10	.65
4.	Chemical Activities	11	.71
5.	Clerical Activities	12	.60
6.	Construction	10	.61
7.	Customer Sales and Service	13	.59
8.	Electrical and Electronic Assembly and Maintenance	10	.81
9.	Food Preparation	12	.55
10.	Human Assessment and Interpersonal Relations	10	.73
11.	Ideational Activities	11	.50
12.	Instruction	10	.57
13.	Mechanical and Structural Drawing	10	.66
14.	Mechanical Maintenance	11	.82
15.	Medical and Related Activities	13	.69
16.	Navigation and Navigational Communications	10	.67
17.	Operation of Vehicles and Mechanized Equipment	10	.69
18.	Performing Arts	12	.70
19.	Physical Coordination and Rush Situations	10	.38
20.	Supervision and Organization of Work	10	.60
21.	Utilization of Numerical Data	11	.58
22.	Visual Arts	12	.60

Table 5

Unadjusted and Adjusted Reliability Estimates for 22 Interest Scales Based on VAPP-1 Data (n = 100)

Scale Number and Title	Unadjusted Reliability Estimate	Adjusted Reliability Estimate
1. Agronomy	.90	.91
2. Animal Care and Training	.94	.95
3. Assembly	.86	.88
4. Chemical Activities	.93	.94
5. Clerical Activities	.88	.89
6. Construction	.84	.89
7. Customer Sales and Service	.85	.89
8. Electrical and Electronic Assembly and Maintenance	.95	.95
9. Food Preparation	.83	.87
10. Human Assessment and Interpersonal Relations	.92	.93
11. Ideational Activities	.83	.84
12. Instruction	.80	.84
13. Mechanical and Structural Drawing	.90	.92
14. Mechanical Maintenance	.94	.95
15. Medical and Related Activities	.92	.92
16. Navigation and Navigational Communi-cations	.89	.90
17. Operation of Vehicles and Mechanized Equipment	.88	.91
18. Performing Arts	.90	.92
19. Physical Coordination and Rush Situations	.50	.72
20. Supervision and Organization of Work	.79	.83
21. Utilization of Numerical Data	.86	.88
22. Visual Arts	.86	.88

Table 6

Frequency and Percentage Distributions of the 231 Correlations Among All 22 Interest Scales Based on VAPP-1 Data (n = 100)

Range of Correlation Coefficients	Frequency	Percentage
+.90 - .99	1	0.4
+.80 - .89	1	0.4
+.70 - .79	6	2.6
+.60 - .69	9	3.9
+.50 - .59	14	6.1
+.40 - .49	37	16.0
+.30 - .39	28	12.1
+.20 - .29	32	13.9
+.10 - .19	42	18.2
+.00 - .09	38	16.4
-.01 - .10	15	6.5
-.11 - .20	7	3.0
-.21 - .30	1	0.4

Correlations Among VAPP-1 and OVIS Scale Scores

As mentioned, the sample of 100 undergraduate students was administered the Ohio Vocational Interest Survey (OVIS) as well as the VAPP-1. In administering the OVIS, the investigators reasoned that significant correlations between the VAPP-1 scales and selected OVIS scales would lend some initial support to the construct validity of the VAPP. Accordingly, the investigators matched each of 21 VAPP scale descriptions with one or more OVIS scale descriptions which, on a rational basis, seemed

to be related to the VAPP scale in question.[3] In matching the scales, the investigators selected those OVIS scales that they predicted would correlate substantially with a particular VAPP scale. In most instances, however, the selected OVIS scale was not judged to be equivalent to the VAPP scale but only related to it to some significant extent.

The Pearson correlations of 21 VAPP scales with their pre-matched OVIS scales are shown in Table 7, and the correlations of all 22 VAPP scales with all 24 OVIS scales are shown in Appendix I. In Table 7, the OVIS scales that were matched to each VAPP scale are listed in order of their judged degree of relationship with the VAPP scale. Thus, it was predicted that an OVIS scale in the "a" position would correlate more highly with the VAPP scale in question than would an OVIS scale occupying the "b" position for that same VAPP scale. It can be seen in Table 7 that the correlations between the VAPP scales and matched OVIS scales in the "a" positions ranged from a low of .35 (for VAPP Scale 11) to a high of .79 (for VAPP Scale 5). In 8 of the 12 cases where more than one OVIS scale was matched with a VAPP scale, the OVIS scale in the "a" position had the highest correlation with the VAPP scale. Moreover, for all of the VAPP scales (with the exception of Scale 19, for which there was no OVIS match), the correlation with the matched OVIS scale in the "a" position was statistically significant ($p < .01$); and for 18 of the VAPP scales, that correlation was .50 or higher.

Item and Scale Elimination and Revision Based on the VAPP-1 Analyses

Based on the results of the VAPP-1 analyses, it was decided that Scale 19 (Physical Coordination and Rush Situations) should be eliminated. Because of the rather general and ambiguous definition of the OAI factor on which Scale 19 was based, the investigators had doubts about the feasibility of the scale at the beginning of the study. Those misgivings were confirmed by the relatively low item-scale correlations (median $\underline{r}$ = .38) and scale reliability (.50) obtained for Scale 19 in the VAPP-1 analyses.

Following the administration of the VAPP-1, Scale 16, Navigation and Navigational Communications, was redefined and retitled "Environmental Communications" based on an expanded definition of its correspondent OAI second-order factor. The revised definition of Scale 16 necessitated the elimination and replacement of six items which, though statistically satisfactory, were no longer congruent with the scale definition. The revised definition of Scale 16 can be seen in Appendix A.

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[3]Although there were 22 VAPP scales, none of the OVIS scales seemed to be significantly related to VAPP Scale 19 (Physical Coordination and Rush Situations), and therefore no predictions were made concerning that scale.

Table 7

Pearson Correlations Between VAPP Scales and Matched OVIS Scales (n = 100)

VAPP-1 Scales	OVIS Scales[a]	Correlation[b]
1. Agronomy	a. Agriculture	.71
	b. Manual Work	.49
2. Animal Care and Training	a. Care of People and Animals	.50
	b. Training	.49
	c. Agriculture	.51
3. Assembly	a. Manual Work	.50
	b. Crafts and Precise Operations	.71
	c. Inspecting and Testing	.61
4. Chemical Activities	a. Applied Technology	.55
	b. Appraisal	.70
	c. Inspecting and Testing	.31
5. Clerical Activities	a. Clerical Work	.79
6. Construction	a. Crafts and Precise Operations	.69
7. Customer Sales and Service	a. Customer Services	.64
	b. Sales Representative	.62
	c. Personal Service	.57
8. Electrical and Electronic Assembly and Maintenance	a. Crafts and Precise Operations	.72
	b. Applied Technology	.69
9. Food Preparation	a. Skilled Personal Services	.64
10. Human Assessment and Interpersonal Relations	a. Promotion and Communication	.44
	b. Teaching, Counseling, and Social Work	.51
11. Ideational Activities	a. Literary	.35
	b. Applied Technology	.09
	c. Management and Supervision	.30
12. Instruction	a. Teaching, Counseling, and Social Work	.64
	b. Training	.25
13. Mechanical and Structural Drawing	a. Applied Technology	.75

Table 7 (continued)

VAPP-1 Scales		OVIS Scales[a]	Correlation[b]
14. Mechanical Maintenance	a.	Crafts and Precise Operations	.77
	b.	Machine Work	.74
	c.	Sales Representative	.50
15. Medical and Related Activities	a.	Medical	.79
	b.	Nursing and Related Technical Services	.71
	c.	Care of People and Animals	.46
16. Navigation and Navigational Communications	a.	Crafts and Precise Operations	.47
17. Operation of Vehicles and Mechanized Equipment	a.	Machine Work	.68
18. Performing Arts	a.	Entertainment and Performing Arts	.79
	b.	Music	.68
19. Physical Coordination and Rush Situations		NO MATCH	
20. Supervision and Organization of Work	a.	Management and Supervision	.72
21. Utilization of Numerical Data	a.	Numerical	.77
22. Visual Arts	a.	Artistic	.76

[a]An OVIS scale in an "a" position was predicted to have a higher correlation with its matched VAPP scale than OVIS scales in "b" and "c" positions for that same VAPP scale; an OVIS scale in a "b" position was predicted to have a higher correlation than an OVIS scale in a "c" position.

[b]A correlation of .26 is significant at the .01 level.

With the exception of items in the forenamed scales, the VAPP-1 items were eliminated, replaced, and revised according to the following procedures:

(a) Items eliciting more than 84 percent "Like" or "Not Like" responses were eliminated.

(b) Items that correlated less than .30 with their corrected intended scales (i.e., parent scales whose scores did not include the items in question) were eliminated.

(c) Items that correlated more highly with unintended scales than with their uncorrected intended scales (i.e., parent scales whose scores included the items in question) were eliminated.

(d) Two items that in the judgment of the investigators had low "face validity" were eliminated. (Those two items also had higher correlations with unintended scales than with their corrected intended scales.)

(e) One item that was otherwise satisfactory was eliminated because it was too similar to another item in its scale (i.e., both items began, "Trim the . . .").

(f) One item was eliminated through clerical error.

(g) If more than 10 items remained in a VAPP-1 scale following item elimination for the reasons specified above, the 10 items in that scale having the highest item-scale correlations were retained and the remainder were eliminated.

(h) If less than 10 items remained in a VAPP-1 scale following item elimination for the reasons described in (a) through (g) above, unsatisfactory items were revised or new items were written in order to provide a total of 10 statistically satisfactory or new items for each scale.

The specific disposition of each item in the VAPP-1 can be determined from an examination of the table in Appendix F.

Thus, under the preceding procedures, 10 items were retained for each of 21 VAPP scales. The 210 retained items were compiled into a revised instrument, the VAPP-2.

Administration and Analysis of the Revised Form of the Vocational Activity Preference Profile (VAPP-2)

The 210 items retained from the VAPP-1 analyses were compiled into the VAPP-2 according to the following procedure:

(a) First, the items were randomly assigned by scale to two forms, A and B; five items from each scale were assigned to Form A and five items to Form B.

(b) Next, the five items selected for each form from each scale were randomly assigned the numbers 1 through 5; that is, for each form, the selected items were arranged in random order within each of the 21 scales.

(c) Within each form, the first item from Scale 1 was then assigned the first item position in that form, the first item from Scale 2 the second item position in the form, the first item in Scale 3 the third position, and so on, until the first items in the 21 VAPP-2 scales had been assigned the first 21 item positions in the form. Under the same procedure, the second items in the 21 scales were then assigned item positions 22 through 42; the third items in the 21 scales, item positions 43 through 53; and so on, until all items had been assigned and the 105 item positions in each form were filled.

Although the VAPP-2 was divided into two forms for testing purposes, all subjects completed both Forms A and B during one testing session, and the two forms were combined for analysis purposes into one inventory of 210 items (10 items for each of the 21 VAPP-2 scales).

The same response format used with the VAPP-1 was used with the VAPP-2: A--LIKE, B--NO OPINION, C--NOT LIKE. (See Appendix J.)

Administration of the VAPP-2 to Students in Grades 9-12

The VAPP-2 was administered to students enrolled in grades 9-12 in six public schools located near Raleigh, North Carolina. A guidance counselor at each of the six schools was asked to select a class of approximately 30 students from each of four grades, 9-12, taught at that school. It was requested that the selected classes be composed of approximately half male and half female students, contain black students in approximate proportion to their representation in the total student body, and be relatively heterogeneous in terms of the students' academic achievement. Usable data were obtained from a total of 506 students: 166 ninth graders, 98 tenth graders, 123 eleventh graders, and 119 twelfth graders. Of those, 219 were males and 287 were females. Although the racial identity of individuals was not recorded, it is estimated that 20 to 25 percent of the students were black and the remainder white.

The VAPP-2 was administered by graduate students in psychology and occupational education during 15 separate testing sessions of 17 to 109 subjects. The sessions were conducted at the six schools during regular 55-minute class periods; a teacher or counselor attended each session. The number of graduate-student proctors varied from one to three, depending upon the number of students in a session. With the exception of one twelfth-grade class, students who were unable to complete the inventory during the 55-minute period were allowed up to 20 additional minutes to finish.

A proctor explained the VAPP to the students in each session and informed them that there were no right or wrong answers. They were told that their individual results would be reported to them within a few weeks. Each student was then given a number 2 lead pencil, one copy of Form A, one copy of Form B, and a color-coded Optical Scanning answer sheet for each of the two forms (a yellow strip for Form A, a pink stripe for Form B). After distributing the materials, the proctor read the instructions on the cover page of Form A, with sufficient pauses between steps to allow the students to enter the appropriate background information on the Form A answer sheet; i.e., name, school, grade, and sex. The Form A instructions are contained in Appendix J. After the instructions had been read and the students had entered the appropriate background data on their answer sheets, they were instructed to begin responding to the Form A items and to raise their hands when they had completed Form A. When a student indicated that he/she had completed Form A, a proctor collected the Form A materials and instructed the student to read the Form B instructions and complete Form B. The Form B instructions, item format, and answer sheet were essentially the same as those for Form A.

Completed answer sheets were checked to determine if there were responses for all items and if the responses were marked heavily enough to be read by the optical scanner. Answer sheets that had more than five unmarked items or that had responses for all 160 item positions (there were only 110 items in each form) were removed from the sample. In cases where an answer sheet had five or fewer unmarked items, response position "b" ("No Opinion") was marked for those items. In the few instances where response positions "d" or "e" were accidently marked (there were no response alternatives for those positions), the marks were erased and changed to position "b." Of the 539 students tested, 33 were removed from the sample because their answer sheets were unusable, leaving a total of 506 students in the sample.

Item and Scale Statistics for the VAPP-2

The item scoring procedure for the VAPP-2 was the same as that described for the VAPP-1. The response distribution and the mean response value for each of the 210 VAPP-2 items are shown in Appendix K. It can be seen in Appendix K that the percentage of "Like" responses ranged from 12.0 to 73.5, while the percentage of "Not Like" responses

ranged from 8.5 to 69.0. Both of those ranges are narrower than those obtained from the VAPP-1.

A subject's score on each VAPP-2 scale was computed by summing his/her response values (1, 2, or 3) for all 10 items representing the scale. Appendix L presents the frequency distributions of the scores on the 21 VAPP-2 scales, and Table 8 presents the means, standard deviations, and mean percentages of maximum possible scale scores. In Table 8, the maximum possible scale score equals the number of items (10) times the maximum possible response value (3); the percentage of the maximum possible scale score equals the subject's obtained scale score divided by the maximum possible score (30). Thus, the mean percentage of the maximum possible scale score serves as an index of scale popularity. As shown in Table 8, the scale popularity index for the 506 students sampled ranged from a low of 33.1 for Chemical Activities to a high of 62.1 for Ideational Activities; that is considerably narrower than the range of 25 to 85 percent obtained from the administration of the VAPP-1 to college students.

Table 9 presents the mean scale scores for 219 males and 287 females. From this table, it can be seen that the largest sex differences in favor of males occurred on Scales 3 (Assembly), 6 (Construction), 8 (Electrical and Electronic Assembly and Maintenance), 13 (Mechanical and Structural Drawing), 14 (Mechanical Maintenance), and 17 (Vehicles and Mechanized Equipment). On the other hand, the greatest differences in favor of females occurred on Scales 5 (Clerical Activities), 9 (Food Preparation), 10 (Human Assessment and Interpersonal Relations), 15 (Medical and Related Activities), 18 (Performing /rts), and 21 (Visual Arts).

The Pearson correlations of all VAPP-2 items with their corrected intended scales are shown in Appendix M, and the median corrected item-scale correlations for the 21 VAPP-2 scales are shown in Table 10. (As indicated in the description of the VAPP-1 analyses, a corrected item-scale correlation is the correlation between an item and its intended scale when the item in question is removed from the scale.) It can be seen in Table 10 that the median corrected item-scale correlations ranged from a low of +.48 for Scale 19 (Supervision and Organization of Work) to a high of +.83 for Scale 8 (Electrical and Electronic Assembly and Maintenance). The corrected correlations for individual items ranged from +.35 to +.86 (see Appendix M).

Correlations were also computed between each VAPP-2 item and all 20 scales for which it was <u>not</u> intended. It was found that 12 items correlated more highly with unintended scales than with their corrected intended scales. Appendix N identifies those items and shows their correlations with the intended and unintended scales.

The reliabilities of the total scale scores for the VAPP-2 were estimated by the same analysis-of-variance procedure that was used with the VAPP-1 (Winer, 1971). Table 11 presents the unadjusted and adjusted reliability coefficients for scores on the 21 VAPP-2 scales. As indicated

Table 8

Means, Standard Deviations, and Mean Percentages of Maximum Possible Scale Scores for 21 Interest Scales Based on VAPP-2 Data (n = 506)

Scale Number	Scale Title	Mean Scale Scores	Standard Deviation	Mean Percent of Maximum Scale Score
1	Agronomy	17.2	5.67	36.1
2	Animal Care and Training	20.4	6.74	51.9
3	Assembly	17.8	5.88	39.1
4	Chemical Activities	16.6	6.12	33.1
5	Clerical Activities	18.3	6.29	41.6
6	Construction	18.1	5.43	40.5
7	Customer Sales and Service	21.2	5.53	56.2
8	Electrical and Electronic Assembly and Maintenance	17.0	6.94	35.2
9	Food Preparation	17.5	5.68	37.6
10	Human Assessment and Interpersonal Relations	22.2	6.17	60.8
11	Ideational Activities	22.4	5.37	62.1
12	Instruction	21.4	5.43	57.0
13	Mechanical and Structural Drawing	17.7	6.29	38.5
14	Mechanical Maintenance	17.6	7.17	38.3
15	Medical and Related Activities	20.5	6.69	52.6
16	Environmental Communications	19.4	5.58	47.1
17	Operation of Vehicles and Mechanized Equipment	20.4	5.86	52.0
18	Performing Arts	17.8	6.03	38.7
19	Supervision and Organization of Work	21.6	4.82	57.8
20	Utilization of Numerical Data	18.6	5.39	43.1
21	Visual Arts	22.0	5.64	59.9
	Overall Scale Mean	19.3		46.6

Table 9

Mean VAPP-2 Scale Scores for Males and Females

Scale Number	Scale Title	Scale Total Mean Male (n=219)	Scale Total Mean Female (n=287)
1	Agronomy	17.5	17.0
2	Animal Care and Training	18.2	22.0
3	Assembly	20.9	15.4
4	Chemical Activities	17.1	16.3
5	Clerical Activities	14.4	21.3
6	Construction	20.4	16.3
7	Customer Sales and Service	20.5	21.8
8	Electrical and Electronic Assembly and Maintenance	21.3	13.8
9	Food Preparation	15.6	19.0
10	Human Assessment and Interpersonal Relations	19.5	24.2
11	Ideational Activities	21.6	23.0
12	Instruction	19.8	22.6
13	Mechanical and Structural Drawing	21.4	14.9
14	Mechanical Maintenance	22.5	14.0
15	Medical and Related Activities	18.6	22.0
16	Environmental Communications	21.3	18.1
17	Operation of Vehicles and Mechanized Equipment	22.9	18.5
18	Performing Arts	15.1	19.7
19	Supervision and Organization of Work	21.6	21.6
20	Utilization of Numerical Data	18.4	18.8
21	Visual Arts	18.2	24.4

Table 10

Median Correlations Between VAPP-2 Items and Their Intended Scales (n = 506)

Scale Number	Scale Title	Median r
1	Agronomy	.65
2	Animal Care and Training	.71
3	Assembly	.64
4	Chemical Activities	.72
5	Clerical Activities	.70
6	Construction	.64
7	Customer Sales and Service	.65
8	Electrical and Electronic Assembly and Maintenance	.83
9	Food Preparation	.62
10	Human Assessment and Interpersonal Relations	.71
11	Ideational Activities	.61
12	Instruction	.61
13	Mechanical and Structural Drawing	.72
14	Mechanical Maintenance	.81
15	Medical and Related Activities	.73
16	Environmental Communications	.62
17	Operation of Vehicles and Mechanized Equipment	.64
18	Performing Arts	.65
19	Supervision and Organization of Work	.48
20	Utilization of Numerical Data	.59
21	Visual Arts	.60

Table 11

Unadjusted and Adjusted Reliability Estimates for 21 Interest Scales Based on VAPP-2 Data (n = 494)[a]

Scale Number and Title	Unadjusted Estimate	Adjusted Estimate
1 Agronomy	.89	.92
2 Animal Care and Training	.93	.95
3 Assembly	.89	.92
4 Chemical Activities	.92	.94
5 Clerical Activities	.91	.93
6 Construction	.84	.90
7 Customer Sales and Service	.86	.91
8 Electrical and Electronic Assembly and Maintenance	.95	.96
9 Food Preparation	.87	.91
10 Human Assessment and Interpersonal Relations	.91	.94
11 Ideational Activities	.87	.90
12 Instruction	.85	.90
13 Mechanical and Structural Drawing	.91	.94
14 Mechanical Maintenance	.95	.97
15 Medical and Related Activities	.92	.95
16 Environmental Communications	.85	.90
17 Operation of Vehicles and Mechanized Equipment	.86	.92
18 Performing Arts	.88	.92
19 Supervision and Organization of Work	.79	.87
20 Utilization of Numerical Data	.84	.89
21 Visual Arts	.86	.90

[a]The sample size in this analysis was reduced from the original 506 cases to 494 cases. Because the original data were inadvertently erased from disc prior to this analysis, it was necessary to rescore the answer sheets in order to restore the data. Prior to or during the rescoring process, 12 answer sheets were lost, thus reducing the sample by 12 cases.

earlier, both the unadjusted and adjusted coefficients estimate the correlation that would be obtained if the subjects' scores on the scale in question were correlated with their scores on a comparable scale containing the same number of new but similar items. However, the unadjusted coefficient estimates reliabilities for scale scores based on summed raw item responses, while the adjusted coefficient provides reliability estimates for scale scores based on the sums of standardized item responses. In the present study, the unadjusted coefficient provides the better estimate, since raw item responses were summed to obtain VAPP-2 scale scores. It can be seen in Table 11 that the unadjusted reliabilities range from a low of .79 for Scale 19 (Supervision and Organization of Work) to a high of .95 for Scales 8 and 14 (Electrical and Electronic Assembly and Maintenance--Mechanical Maintenance).

The Pearson correlations among the scores on all 21 VAPP-2 interest scales are presented in Appendix O. Those inter-scale correlations ranged from a low of -.23 between Scales 10 and 14 (Human Assessment and Interpersonal Relations--Mechanical Maintenance) to a high of +.88 between Scales 8 and 14 (Electrical and Electronic Assembly and Maintenance--Mechanical Maintenance). The median inter-scale correlation was +.28. Table 12 presents the frequency and percentage distributions for the 210 correlations among the 21 VAPP-2 scales, along with the comparable distributions for the scales of the Ohio Vocational Interest Survey (D'Costa et al., 1970), the Strong-Campbell Interest Inventory (Campbell, 1974), and the Kuder Preference Record (Cottle, 1968). It can be seen in Table 12 that there are some sizable correlations among some of the VAPP-2 scales. Of the 210 correlations among the 21 VAPP-2 scales, 15.7 percent (33 of the 210) are .50 or higher. The corresponding figures for the reported intercorrelations among the OVIS, Strong basic, and Kuder scales are 32.6, 8.1, and 4.4 percent, respectively.

Report of Individual Results to the Students

Upon completion of the VAPP-2 scoring, each student who participated in the study and turned in scorable answer sheets (i.e., 506 of the 539 students who were tested) was given a profile report which presented his/her scores on the 21 scales in terms of percentages of maximum possible scale scores. Each student also received a booklet containing instructions on how to interpret his/her scores and descriptions of the areas of work associated with the 21 VAPP-2 scales. The interpretation booklet and an example of the student report form appear in Appendix P. The report form and its accompanying booklet were constructed solely for purposes of the present study (i.e., in order to return some results to the participants) and were not designed as prototypes of materials for ultimate use with the VAPP.

Table 12

Frequency and Percentage Distributions of the Correlations Among Scales for the VAPP-2, OVIS, Strong (Basic Scales), and Kuder (KPR-V)[a]

Range of Correlations	VAPP-2 (21 Scales)		OVIS[b] (24 Scales)		Strong[c] (22 Scales)		Kuder[d] (10 Scales)	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
+.80 - .89	3	1.4	4	1.4	1	0.4		
+.70 - .79	7	3.3	11	4.0	4	1.7		
+.60 - .69	9	4.3	27	9.8	7	3.0	1	2.2
+.50 - .59	14	6.7	48	17.4	7	3.0	1	2.2
+.40 - .49	25	11.9	52	18.8	12	5.2	1	2.2
+.30 - .39	39	18.6	63	22.8	28	12.1	2	4.4
+.20 - .29	42	20.0	56	20.3	54	23.4	4	8.9
+.10 - .19	27	12.8	15	5.4	41	17.8	2	4.4
+.00 - .09	18	8.6			33	14.3	4	8.9
-.01 - .10	16	7.6			27	11.7	7	15.5
-.11 - .20	9	4.3			15	6.5	5	11.1
-.21 - .30	1	0.5			2	0.9	10	22.2
-.31 - .40							5	11.1
-.41 - .50							3	6.7

[a]The number of correlations for each inventory equals K(K-1)/2, where K represents the number of scales in the inventory.

[b]D'Costa *et al.* (1970)

[c]Campbell (1974) [d]Cottle (1968)

Factor Analysis of the 21 VAPP-2 Scales

Because of the substantial correlations among the VAPP-2 scales, it was decided that a factor analysis should be performed on the scales in order to identify a lesser number of basic activity-preference dimensions. The BMDX72 factor analysis program of the Biomedical Computer Programs (Dixon, 1970) was used for that purpose, according to the following procedure:

(1) The matrix of intercorrelations among the 21 VAPP-2 scales was calculated leaving ones in the major diagonal.

(2) The eigenvalues of the intercorrelation matrix were extracted by the principal axes procedure.

(3) The eigenvalues were plotted in order of their extraction, and Cattell's (1966) "scree test" was used to determine the number of factors to rotate.

(4) The intercorrelation matrix was recalculated, and the principal axes procedure was repeated, except this time multiple correlations were used to estimate scale communalities.

(5) Based on the results of Step 3, it was decided that either seven or eight factors should be rotated. Accordingly, two separate sets of orthogonal rotations were performed (one for seven factors and one for eight factors) by the varimax method. From an examination and comparison of the two resultant factor loading matrices, it was decided that the seven-factor rotation produced more meaningful results.

Table 13 shows the salient loadings of the 21 VAPP-2 scales on the seven rotated factors. All seven of the factors were interpreted, and were titled as follows: Factor I, Working with Hardware; Factor II, Working with People and Ideas; Factor III, Caring for Living Things; Factor IV, Sales and Organizational Activities; Factor V, Scientific and Technical Activities; Factor VI, Artistic and Creative Activities; and Factor VII, Operation of Vehicles and Mechanized Equipment. (The loadings on Factor VII were so low that there was some doubt as to whether that factor should be named.) The cumulative proportion of variance accounted for by the seven factors was .68. Appendix Q presents the complete data on all of the aforementioned steps in the factor analytic procedure.

For the purpose of testing the stability of the factor structure, the total sample of students was divided into two subsamples, and the same factor analytic procedure used with the total sample was applied separately to each of the subsamples. The subsamples were formed by categorizing the students in a grade-by-sex (4 X 2) matrix and then assigning students from each matrix category to the two subsamples on an odd-even basis (i.e., odd-numbered students to Subsample A, even-numbered students to Subsample B). The original factor analytic

Table 13

Salient Loadings of the 21 VAPP-2 Scales
on Seven Factors (n = 494)

Factors and Scales	Rotated Loadings
Factor I: Working with Hardware	
Scale 14 - Mechanical Maintenance	.90
Scale 3 - Assembly	.89
Scale 8 - Electrical and Electronic Assembly and Maintenance	.85
Scale 13 - Mechanical and Structural Drawing	.83
Scale 6 - Construction	.82
Scale 17 - Operation of Vehicles and Mechanized Equipment	.76
Scale 16 - Environmental Communications	.70
Scale 1 - Agronomy	.45
Factor II: Working with People and Ideas	
Scale 10 - Human Assessment and Interpersonal Relations	.85
Scale 11 - Ideational Activities	.77
Scale 12 - Instruction	.70
Scale 19 - Supervision and Organization of Work	.52
Scale 18 - Performing Arts	.38
Scale 15 - Medical and Related Activities	.34
Scale 21 - Visual Arts	.32
Factor III: Caring for Living Things	
Scale 2 - Animal Care and Training	-.76
Scale 15 - Medical and Related Activities	-.50
Scale 1 - Agronomy	-.44
Factor IV: Sales and Organizational Activities	
Scale 7 - Customer Sales and Service	-.65
Scale 5 - Clerical Activities	-.63
Scale 19 - Supervision and Organization of Work	-.60
Scale 20 - Utilization of Numerical Data	-.47
Scale 9 - Food Preparation	-.46
Scale 12 - Instruction	-.32
Factor V: Scientific and Technical Activities	
Scale 4 - Chemical Activities	.73
Scale 15 - Medical and Related Activities	.41
Scale 20 - Utilization of Numerical Data	.38

Table 13 (continued)

Factors and Scales	Rotated Loadings
Factor VI: Artistic and Creative Activities	
Scale 21 - Visual Arts	-.69
Scale 9 - Food Preparation	-.51
Scale 18 - Performing Arts	-.50
Scale 5 - Clerical Activities	-.38
Factor VII: Operation of Vehicles and Mechanized Equipment	
Scale 17 - Operation of Vehicles and Mechanized Equipment	-.35
Scale 16 - Environmental Communications	-.26
Scale 13 - Mechanical and Structural Drawing	.28

procedure was repeated with each subsample; eight factors were rotated in Subsample A and seven factors in Subsample B. The rotated factor matrices from the two subsamples were then compared by Tucker's coefficient of congruence (Gorsuch, 1974; Harman, 1960; Tucker, 1951): a coefficient of congruence was computed between each column of loadings in one matrix and each column in the other (i.e., an 8 X 7 matrix of coefficients was computed).

The resultant coefficients of congruence are shown in Appendix R, along with the rotated factor matrices for the two subsamples. An examination of the two factor matrices showed the factors from Subsample B to be more similar to the original factors (i.e., factors from the total sample) than were those from Subsample A. Accordingly, each of the seven factors in Subsample B were matched with an original factor. For each of the seven factors in Subsample B, the highest coefficient of congruence with a factor in Subsample A was then identified; i.e., the highest of eight coefficients was identified for each factor in Subsample B. Table 14 presents the highest coefficients of congruence for the seven factors in Subsample B. As shown, five of those coefficients exceed .94, and the remaining two coefficients have values of .82 and -.71. (The size of the coefficient, regardless of sign, determines the degree of similarity between two factors.)

Cluster Analysis of the 21 VAPP-2 Scales

In addition to factor analysis, a hierarchical cluster analysis procedure was applied to the matrix of intercorrelations among the 21 VAPP-2 scales. This procedure, originally described by Ward (1961; Ward and Hook, 1963), was carried out on an IBM 370/165 computer with

Table 14

Highest Coefficients of Congruence for the Seven Factors in Subsample B with the Factors in Subsample A

Original Factors	Subsample B Factors	Subsample A Factors	Coefficients of Congruence
I: Working with Hardware	1	1	.99
II: Working with People and Ideas	3	2	.98
III: Caring for Living Things	4	3	.95
IV: Sales and Organizational Activities	2	4	-.97
V: Scientific and Technical Activities	5	6	.82
VI: Artistic and Creative Activities	6	7	-.95
VII: Operation of Vehicles and Mechanized Equipment	7	8	-.71

a modification of the CODAP[4]/Profile Analysis System developed by the Air Force HRL Personnel Research Division, Lackland Air Force Base, Texas (Oats-Hills, 1970). Essentially, the procedure merges two "entities" in each of a succession of steps, until all of the original cases are merged into one group. At the beginning of the procedure, each of the original cases (in this study, each of the 21 VAPP-2 scales) is treated as a separate entity. In the first step of the procedure, the two cases whose profiles are most similar are merged; the merged cases are treated as a single entity in the next step. In each subsequent step, the two entities whose profiles are most similar are merged, with the procedure continuing until all of the original cases have been merged into one group. Although indices are provided to help identify a level in the hierarchy where the clusters are most meaningful, the determination of the point where merging should stop depends primarily upon the investigator's judgment. A more complete description of the hierarchical clustering procedure has been presented in previous Ergometric reports (Pass and Cunningham, 1975; Riccobono, Cunningham, and Boese, 1975).

[4]Comprehensive set of Occupational Data Analysis Programs

Appendix S contains the record of the mergers occurring at each stage in the hierarchical clustering of the VAPP-2 scales. Interpretation was attempted at two levels, one containing nine clusters and the second containing six more general clusters. Tables 15 and 16 present the cluster titles and indicate the VAPP scales contained in each cluster. A comparison of Tables 13 and 16 shows considerable similarity between the first six VAPP factors and the six general VAPP clusters. Indeed, the similarity was close enough to warrant assigning the six clusters in Table 16 the same titles as the six corresponding factors in Table 13.

The intercorrelations among the clusters were determined as follows:

(1) Each student's scores on the scales within each cluster were summed, i.e., the original students-by-scales matrix of VAPP scale scores was collapsed to a students-by-clusters matrix of summed scale scores.

(2) The summed scale scores for each cluster was correlated with the summed scores for every other cluster in the same set, i.e., the cluster intercorrelations were computed within each of the two cluster sets.

The intercorrelation matrices for the two sets of clusters are shown in Appendix S. Table 17 presents the frequency and percentage distributions of the cluster intercorrelations, along with the distributions of the correlations among the 21 VAPP-2 scales. From this table it can be seen that collapsing the 21 scale scores into a lesser number of cluster scores reduced the range of the intercorrelations considerably. With the exception of one correlation, the range of intercorrelations for the set of nine clusters is the same as the range for the set of six clusters. The exception is a correlation of .74 between Clusters I and III in the set of nine. These two clusters were combined into one (Cluster II′) in the set of six clusters (see Tables 15 and 16).

Table 15

Nine Clusters Derived Through a Hierarchical Analysis of the Intercorrelations Among the 21 VAPP-2 Scales

Cluster and Scale Number	Cluster and Scale Titles
Cluster I	Working with Hardware
Scale 3	Assembly
Scale 8	Electrical and Electronic Assembly and Maintenance
Scale 13	Mechanical and Structural Drawing
Scale 14	Mechanical Maintenance
Cluster II	Working with People and Ideas
Scale 10	Human Assessment and Interpersonal Relations
Scale 11	Ideational Activities
Scale 12	Instruction
Cluster III	Construction and Mechanized Vehicle and Equipment Operation
Scale 6	Construction
Scale 16	Environmental Communications
Scale 17	Operation of Vehicles and Mechanized Equipment
Cluster IV	Sales and Organizational Activities
Scale 7	Customer Sales and Service
Scale 19	Supervision and Organization of Work
Cluster V	Clerical Activities[a]
Scale 5	Clerical Activities
Scale 9	Food Preparation
Cluster VI	Artistic Activities
Scale 18	Performing Arts
Scale 21	Visual Arts

Table 15 (continued)

Cluster and Scale Number	Cluster and Scale Titles
Cluster VII	Plant and Animal Care
Scale 1	Agronomy
Scale 2	Animal Care and Training
Cluster VIII	Activities Related to Physical Science and Technology[b]
Scale 4	Chemical Activities
Scale 20	Utilization of Numerical Data
Cluster IX	Medical and Related Activities
Scale 15	Medical and Related Activities

[a]The interpretation of this cluster was based only on Scale 5, Clerical Activities. It was assumed that Scale 9 (Food Preparation) represented a related but less vocationally oriented interest. As noted earlier, females scored higher than males on Scales 5 and 9 (see Table 9).

[b]This cluster was given a broader interpretation than warranted by its constituent scales. However, Scales 4 and 20 are the only VAPP scales related to physical science and technology. Moreover, a re-examination of the higher-order OAI factor on which Scale 4 is based suggested that the factor could have been interpreted as a physical-science-and-technology dimension.

Table 16

Six Clusters Derived Through a Hierarchical Analysis of the Intercorrelations Among the 21 VAPP-2 Scales

Cluster and Scale Number	Cluster and Scale Titles
Cluster I′	Working with People and Ideas (Same as Cluster II, Table 15)
Scale 10	Human Assessment and Interpersonal Relations
Scale 11	Ideational Activities
Scale 12	Instruction
Cluster II′	Working with Hardware (Subsumes Clusters I and III, Table 15)
Scale 3	Assembly
Scale 6	Construction
Scale 8	Electrical and Electronic Assembly and Maintenance
Scale 13	Mechanical and Structural Drawing
Scale 14	Mechanical Maintenance
Scale 16	Environmental Communications
Scale 17	Operation of Vehicles and Mechanized Equipment
Cluster III′	Artistic Activities (Same as Cluster VI, Table 15)
Scale 18	Performing Arts
Scale 21	Visual Arts
Cluster IV′	Activities Related to Physical Science and Technology (Same as Cluster VIII, Table 15)[a]
Scale 4	Chemical Activities
Scale 20	Utilization of Numerical Data

Table 16 (continued)

Cluster and Scale Number	Cluster and Scale Titles
Cluster V'	Sales and Organizational Activities (Subsumes Clusters IV and V, Table 15)
Scale 5	Clerical Activities
Scale 7	Customer Sales and Service
Scale 9	Food Preparation
Scale 19	Supervision and Organization of Work
Cluster VI'	Caring for Living Things (Subsumes Clusters VII and IX, Table 15)
Scale 1	Agronomy
Scale 2	Animal Care and Training
Scale 15	Medical and Related Activities

[a]This category was given a broader interpretation than warranted by its constituent scales. However, Scales 4 and 20 are the only VAPP scales related to physical science and technology. Moreover, a re-examination of the higher-order OAI factor on which Scale 4 is based suggested that the factor could have been interpreted as a physical-science-and-technology dimension.

Table 17

Frequency and Percentage Distributions of the Correlations Among VAPP Scales and VAPP Clusters

Range of Correlations	21 VAPP Scales		9 VAPP Clusters		6 VAPP Clusters	
	f	%	f	%	f	%
+.90 - .99						
+.80 - .89	3	1.4				
+.70 - .79	7	3.3	1	2.8		
+.60 - .69	9	4.3				
+.50 - .59	14	6.7	4	11.1	3	20.0
+.40 - .49	25	11.9	8	22.2	5	33.3
+.30 - .39	39	18.6	9	25.0	2	13.3
+.20 - .29	42	20.0	5	13.9	2	13.3
+.10 - .19	27	12.8	4	11.1	1	6.7
+.00 - .09	18	8.6	2	5.6	1	6.7
-.01 - .10	16	7.6	3	8.3	1	6.7
-.11 - .20	9	4.3				
-.21 - .30	1	0.5				

DISCUSSION

Based on the item and scale statistics obtained with the first version of the Vocational Activity Preference Profile (VAPP-1), it would appear that the initial item generation and screening procedures were reasonably effective. For the most part, the VAPP-1 items correlated substantially with the corrected total scores on their respective scales, and the reliabilities of the total scale scores (i.e., sums of item responses) were higher than might be expected in a pilot instrument. With the exception of two of the 22 VAPP-1 scales, the unadjusted reliability coefficients for total scale scores were .80 or higher.

Although a marked improvement was expected in the VAPP-2 item and scale statistics over those obtained with the VAPP-1, very little statistical difference was found between the two forms. The median corrected item-scale correlations for the 21 VAPP-2 scales ranged from a low of +.48 (for Supervision and Organization of Work) to a high of +.83 (for Electrical and Electronic Assembly and Maintenance), while the median correlations for the 21 corresponding VAPP-1 scales ranged from +.50 to +.82.[5] In 11 cases the median item-scale correlation increased from the VAPP-1 to the VAPP-2, in 9 cases it decreased, and in one case there was no change. Similarly, there was no overall improvement in scale reliabilities from the VAPP-1 to the VAPP-2. The unadjusted reliability coefficients for the 21 VAPP-2 total scale scores ranged from a low of .79 (for Scale 19--Supervision and Organization of Work) to a high of .95 (for Scale 8--Electrical and Electronic Assembly and Maintenance), while the coefficients for the corresponding 21 VAPP-1 scales also ranged from .79 to .95. For eight scales, the unadjusted reliability coefficient increased from the VAPP-1 to the VAPP-2, for another eight scales it decreased, and for one there was no change.

There are two factors which, in combination, may have mitigated against the expected improvement in item and scale statistics from the VAPP-1 to the VAPP-2. The most important factor was the difference in the samples on which the analyses of the two forms were based: the VAPP-1 was administered to 100 college students enrolled in undergraduate psychology courses, while the VAPP-2 was administered to 506 eighth-to-ninth-grade public school students. Thus, it is possible that the college students, being on the average more mature and capable than the public school students, responded more consistently to the VAPP-1 items than the public school students responded to the VAPP-2 items. That difference between the two samples, if it existed, might have offset any improvement in the VAPP-2 items which would otherwise have been reflected in the VAPP-2 statistics. On the other hand, it should be noted that the sample of college students used with the VAPP-1 represents a more restricted population than the VAPP-2 sample of public school students and might,

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[5] Scale 19 in the VAPP-1 (Physical Coordination and Rush Situations) was eliminated and, therefore, is not included in the item and scale comparisons between the two forms.

therefore, be expected to represent a narrower range of interests; that restriction of range could have attenuated the VAPP-1 item-scale correlations and scale reliabilities. A second, but less important, factor may have mitigated against an improvement in the statistics of the VAPP-2 over the VAPP-1 lies in the fact that several VAPP-2 scales had fewer items than their VAPP-1 counterparts and could, therefore, be expected to have lower total score reliabilities unless their items were of better quality than those in the corresponding VAPP-1 scales.

Despite the negligible improvement in the statistics of the VAPP-2 over those of the VAPP-1, the VAPP-2 scale reliabilities are, with the exception of Scale 19 (Supervision and Organization of Work), adequate. The value of the unadjusted coefficient is .84 or higher for 20 of the 21 VAPP-2 scales (Table 11). An addition of four to five items to each scale should produce substantial reliabilities for most of the VAPP scales.

As shown in Table 9, there were differences between the mean scores of males and females on a number of the VAPP-2 scales. The largest differences in favor of males occurred on Scales 3 (Assembly), 6 (Construction), 8 (Electrical and Electronic Assembly and Maintenance), 13 (Mechanical and Structural Drawing), 14 (Mechanical Maintenance), and 17 (Vehicles and Mechanized Equipment); the greatest differences in favor of females occurred on Scales 5 (Clerical Activities), 9 (Food Preparation), 10 (Human Assessment and Interpersonal Relations), 15 (Medical and Related Activities), 18 (Performing Arts), and 21 (Visual Arts). That such differences occurred is neither surprising nor correctable through psychometric procedures. As mentioned, the bases for the VAPP scales were the OAI work dimensions derived through factor analysis of a comprehensive set of work elements applied to a representative sample of occupations; therefore, the VAPP scales should be reasonably representative of the kinds of activities performed for remuneration in our society. In all likelihood, mean sex differences in preferences for those kinds of activities reflect differences in the sex roles defined by the culture. The elimination or reduction of such differences, if it is to be accomplished, is an educational rather than a psychometric problem. Nevertheless, it can be noted that there is usually an appreciable overlap in the distribution of male and female scores on a scale. Thus, even though the mean score for one sex may exceed that of another on a particular scale, some individuals in the group with the lower mean will obtain preference scores exceeding the mean of the higher group. Those individuals should be encouraged to make career decisions based on their personal preferences, independent of their sex category.

As mentioned, the VAPP-1 sample of 100 undergraduate students was also administered the Ohio Vocational Interest Survey (OVIS), and matched VAPP-1 and OVIS scales were correlated in a pilot construct validity analysis. The OVIS was selected for that purpose because, among the existing standardized inventories, the rationale and procedures underlying its development most closely approximated

those of the VAPP; i.e., the OVIS scales are based on an occupational classification scheme (combinations of DOT worker trait groups). Although all but one VAPP-1 scale was matched with one or more OVIS scales, in very few instances did the investigators judge the matched scales to be equivalent. Thus, it was expected that the correlations would be substantial and statistically significant in most cases, but not as high as one would expect between equivalent forms. Indeed, the correlations were substantial in most cases, especially those involving the OVIS scales that were predicted to have the highest correlations with their matched VAPP-1 scales (i.e., the OVIS scales in the "a" positions in Table 7). The 21 correlations between VAPP-1 scales and the matched OVIS scales occupying "a" positions in Table 7 were all statistically significant ($p < .01$), ranged from a low of .35 to a high of .79, and had a median value of .69. Thus, the results show substantial relationships between the activity preferences measured by the VAPP scales and those measured by the scales of an independently developed inventory. Although no strong conclusions can be drawn at this point concerning the construct validity of the VAPP, the findings from this pilot study offer some promise for the outcomes of future construct validity studies involving the VAPP.

Sizable correlations were obtained among some of the 21 VAPP-2 scales. The distribution of the VAPP-2 inter-scale correlations, in comparison with comparable distributions for the OVIS, Strong basic, and Kuder scales, are shown in the Results section (Table 12). It can be seen in Table 12 that the percentage of VAPP-2 inter-scale correlations that are .50 or higher (15.7%, 33 out of 210) is considerably lower than the corresponding percentage for the OVIS scales (32.6%) but quite a bit higher than the percentages for the Strong and Kuder scales (8.1% and 4.4%, respectively). Although the 21 OAI higher-order work dimensions (factors) on which the VAPP scales were based are orthogonal, some substantial correlations were expected among the VAPP scales. The correlations among the OAI work elements and dimensions were based on the work-activity ratings of jobs, while the correlations among the VAPP items and scales were based on the activity-preference responses of students. For that reason, it could not be expected that the orthogonality of the higher-order OAI work dimensions would be maintained in the VAPP scales. Nevertheless, the VAPP scales were not as independent as the investigators had hoped.

Because of the substantial correlations among the VAPP-2 scales, it was decided that the 21 scales should be factor analyzed in order to identify the basic dimensions underlying the students' activity preferences. Of the seven factors rotated, the first six were easily interpreted and the seventh, though marked by low loadings, was named (Operation of Vehicles and Mechanized Equipment). In addition to being readily interpretable, the obtained factor structure showed reasonable stability based on the coefficients of congruence between factors derived from the two subsamples. As shown in Table 14, five of those coefficients exceeded .94, while the remaining two coefficients had values of .82 and -.71. According to Tucker (1951), a value of .9398

is "moderately high" for a coefficient of congruence. By that criterion, it can be concluded that five of the seven factors obtained in Subsample B were replicated in Subsample A, while the remaining two factors were not replicated. It seems reasonable to assume, however, that the factors based on the total sample are more stable than those derived from the two subsamples. Thus, if the factor analyses were to be repeated on a new sample of students comparable to the total sample in this study, it could be expected that the coefficients of congruence between factors from the two samples would be higher than those reported here.

In addition to factor analysis, a hierarchical cluster analysis procedure was applied to the 21 VAPP-2 scales. The scale clusters were interpreted at two levels, one containing nine clusters and the other containing six clusters. As shown in Table 16, three of the six clusters at the second level are the same as clusters at the first level, while the remaining three clusters at the second level each subsume two clusters from the first level. As noted, the six clusters corresponded closely enough to six of the VAPP factors to warrant assigning the factor titles to the clusters.

At both levels, the range of intercorrelations among scale clusters is considerably narrower than the range of intercorrelations among the 21 VAPP scales; and, with the exception of one correlation, the range of intercorrelations for the set of nine clusters is the same as the range for the set of six clusters (see Table 17). That one exception is a correlation of .74 between Clusters I and III in the set of nine. A merger of those two clusters would reduce the set to eight low-to-moderately intercorrelated scale clusters, which might provide a reasonable basis for the development of a revised set of VAPP scales.

Interestingly, five of the VAPP factors and matching clusters appear to correspond rather closely with Holland's (1973) six occupationally related personality types. These judgmentally based relationships between the VAPP and Holland dimensions are shown in Table 18. In future research, it would be interesting to test the hypothesized relationships between the VAPP factors and Holland's six personality types as measured by his Vocational Preference Inventory.

As a whole, the results are encouraging. The 21 scales of the Vocational Activity Preference Profile are reasonably reliable and show some promise in terms of construct validity. Future efforts should be made, however, to reduce the interscale correlations, possibly by merging the highly correlated scales into the eight previously mentioned clusters.

Based on this study, it would appear that an ergometric approach to interest measurement is feasible and that an improved version of the VAPP could prove useful in relating students' activity preferences to the activities associated with occupations and occupational clusters in the OAI-based taxonomy. A brief description of an occupational information and guidance system that might utilize a revised VAPP can be found in Appendix T. In its present form, however, the VAPP should be used only for research purposes.

Table 18

Judgmentally Determined Relationships Between VAPP Factors, VAPP Clusters, and Holland's Personality Types

	VAPP Factors (Table 13)	VAPP Clusters (Table 16)	Holland's Personality Types
I.	Working with Hardware	II'	Realistic
II.	Woring with People and Ideas	I'	Social
III.	Caring for Living Things	VI'	--
IV.	Sales and Organizational Activities	V'	Enterprising; Conventional
V.	Scientific and Technical Activities	IV'	Investigative
VI.	Artistic and Creative Activities	III'	Artistic
VII.	Operation of Vehicles and Mechanized Equipment	--	--

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APPENDICES

APPENDIX A

DEFINITIONS OF 22 INTEREST SCALES CORRESPONDING TO HIGHER-ORDER FACTORS DERIVED FROM THE OCCUPATION ANALYSIS INVENTORY

Scale #1

Agronomy

The Agronomy scale includes activities involving plant life, terrain features, and earthworking with farm machinery. Cutting and trimming plants and crops are classified as agronomy activities, as are activities involving man-made land features (e.g., ponds or irrigation ditches) and minimally processed plant products (e.g., grading and packaging fruit or vegetables).

Botanical goals including the maintenance of plant life, the preparation of soil for transplanting trees and shrubs, and the harvesting of plant products are another part of this scale. The use of tables, graphs, charts, and maps as they apply to soil and plant life are also included. Activities associated with weather, water conditions (for purpose of irrigation), and environmental emergencies belong to this dimension. Reading and writing articles concerning the care of plants and field crops are part of this scale.

Scale #2

Animal Care and Training

This scale includes various aspects of animal handling in general, such as training, grooming, exercising, and feeding. Individuals who enjoy working on the appearance of animals (e.g., trimming, combing, washing) would score high on this scale; likewise, individuals who improve, assess, or control the performance or behavior of animals (e.g., trainers, judges of animal shows or races) would also score high.

Caring for animals is also an important part of this factor; their dietary needs or deficiencies and their state of health or hygiene are major considerations of many occupations in this dimension. In addition, miscellaneous biological characteristics of animals are included as an area of concern, since occupations such as breeder require some knowledge of the biological aspects of the animals handled. Written communications pertaining to animals are often utilized in the various jobs representative of this area.

Scale #3

Assembly

This scale primarily addresses itself to the assembly or fabrication of objects made to standardized specifications from various interconnected parts or materials. These activities are generally performed in a factory setting, and mechanical fastening tools (possibly electrically powered) or hand tools (e.g., screwdriver or stapler) are used to join the pieces of various objects together.

Basically, the specific objects produced from these activities consist of prefabricated parts which have been fastened well together using screws, non-electrical wire, wire products, staples, brads, and numerous other fastening devices. Miscellaneous mechanical and metal parts as well as synthetic materials (e.g., rubber and plastic) are also joined together in the production of these items. Special attention is paid in this dimension to the interrelation, positioning, and fit of connected parts or objects; the connections and fastenings of objects and parts; and the appearance of assembled or constructed items. Inspection or testing of assembled or fabricated objects for safety, proper functioning, appearance, construction, etc., is also represented by this factor.

Scale #4

Chemical Activities

This scale includes activities where symbol systems and technical written material concerning physical properties and chemical reactivity are used. Activities involving chemical hazards or the use of devices to measure the properties of materials are included. The prediction and observation of chemical reactivity are part of this scale. The treatment and mechanical modification of materials are represented by this scale. The characterization of substances by measuring, counting, and inspecting are legitimate scale activities. Combining, separating, and other handling of chemical and petroleum substances are included. Tasks involving measurement by weight or volume are part of the scale along with activities involving the chemical treatment of substances. Reading and writing technical articles about chemical reactions and the chemical characteristics of substances are activities representative of the scale.

Scale #5

Clerical Activities

Individuals who score high on this interest scale like to perform various clerical tasks. Editing written material for composition, format, punctuation, spelling, and grammar is a common task in this domain. Various classification and categorization activities, such as compiling, filing, sorting, and alphabetizing, are also representative of this area of interest. Likewise, comparing lists or manuscripts for the purpose of checking for errors in spelling, addresses, numbers, etc., is included in this dimension.

In addition to dealing with written material, individuals with high scores in this area sometimes perform tasks which require that verbal information be transcribed (e.g., taking dictation, operating a transcribing machine, taking phone messages). Activities in this dimension generally require the use of pen or pencil and paper, or the use of machinery which produces written material, such as a typewriter. Also, office machinery may be used in these jobs to perform some of the activities; for example, a collating machine may be used, or a card sorter.

Scale #6

Construction

This scale includes activities of a physical nature which are goal-oriented toward the completion or maintenance of buildings or other structures. The activities often involve manual labor. For example, preparing and finishing surfaces (e.g., smoothing concrete and painting) and working with shaped objects are included. The installation and attachment of objects and fixtures (e.g., carpeting, tile, plumbing, and hardware) as experienced in construction activities are also represented. The scale includes the inspection of constructed buildings and structures.

Scale #7

Customer Sales and Service

The primary foci of this dimension are customer reaction (i.e., satisfaction with services, response to advertising, etc.) and sales transactions (i.e., payments received, contracts signed, etc.). Individuals scoring high on this scale like to attend to the immediate needs and requests of customers purchasing goods or services, and they provide individual customers and the general public with various information. These individuals may handle checks, cash, money orders, credit cards, or other media of exchange in dealing with merchandise of a tangible nature (e.g., tractors, food, clothes) or with services performed (e.g., items delivered).

Scale #8

Electrical and Electronic Assembly and Maintenance

This scale is concerned with the assembly, inspection, installation, repair, and adjustment of electrical and electronic devices. Activities include determining the cause of electrical or electronic malfunctions, maintaining and restoring functionality to such equipment, and detection of substandard output from electrical or electronic devices. Reading diagrams, schematic drawings, electronic symbols and written material about electrical and electronic equipment is also included. Precision work, electrical treatment, and testing electrical or electronic components and equipment are also important types of activities on this scale.

Information pertaining to electrical and electronic test equipment is an integral part of this dimension. Some common concerns are preventive maintenance and visual or auditory displays of electrical and electronic information.

Scale #9

Food Preparation

This factor relates to the various aspects of food preparation. Knowledge of flavor, odor, and edibility is very important; in addition, materials and devices related to nutrition, sanitation, and the preparation of food are utilized. Some of the characteristics associated with jobs representative of this dimension are: sudden temperature changes and either high or low temperatures which can cause bodily discomfort; humidity which is not a result of weather conditions; and dampness or wetness, such as that experienced in washing dishes, utensils, or vegetables.

Scale #10

Human Assessment and Interpersonal Relations

This is a broad dimension consisting of various modes of human assessment and the investigation or consideration of interpersonal relations. Individuals who score high on this scale deal with descriptions of individuals, events involving people, characteristics of groups of people, and the habitat or environment in which people exist. Areas of human behavior which might be investigated or assessed under this dimension would be verbal performance; experience; moods, attitudes, opinions, feelings, intentions, desires; physical performance; and adjustment and

adaptation. Improvement or any other sort of change in any of these behavioral areas may also be considered. Information or data regarding these topics might be handled in the form of tables, graphs, diagrams, charts, or written communications.

Some activities which represent this scale are arbitration, mediation, negotiation, pacification, discussion, debate, advice, or counseling. Innovations or plans pertaining to people are possible products of such occupations. Sometimes, occupations which load highly on this dimension are concomitant with interpersonal conflict resolution, unpleasant or uncomfortable social relationships, conflicting job demands, or moral value conflicts. The occupations loading highly on this factor may be performed in crowd situations, group settings, or crisis situations.

Scale #11

Ideational Activities

This dimension comprises a fairly broad spectrum of ideational activities dealing with ideas, memory, plans, problems, and the perception of situations. Occupations which score high on this scale require facility in the rapid and fluent expression of ideas and in the production of many ideas appropriate to a given subject. The abilities to verbalize ideas and to comprehend verbal expressions of others permeate all facets of this scale. Individuals in such occupations might be required to produce a wide variety of ideas in a problem situation or to produce clever, novel, or uncommon ideas. Planning is used in this scale to originate the details of an approach and to arrange these details in some relationship to achieve a goal. Some consideration is also given to the memory of ideas.

Another component of this dimension centers around problems: their detection, and the identification and comprehension of possible causes and effects. A number of alternative solutions to a given problem may be produced. Deductive reasoning may also be involved.

Scale #12

Instruction

This interest area deals with instruction or teaching. An individual with a high score on this factor enjoys teaching subject matter of various types, developing performance skills in other persons, and associating with students in general. These individuals may use audio-visual equipment or still picture devices in the performance of their jobs. They may also use a foreign language, either modern or classical, written or spoken.

A common activity in this dimension is the assessment and improvement of another person's knowledge and skill. Frequently, individuals scoring high on this scale have obligations either in the community or in social activities outside of normal work hours.

Scale #13

Mechanical and Structural Drawing

Mechanical and Structural Drawing includes activities related to mechanical plans and drawings of constructed objects; innovations and conceptualizations concerning the assembly, fabrication, modification, construction, installation, or spatial arrangement of objects; and written communications pertaining to mechanical principles, object modification, or spatial arrangement are part of this scale. Written communications include reading and writing about mechanical principles involved with mechanical and structural drawing. The use of diagrams, charts, maps, and drawing devices is included as they apply to the clarification and elucidation of mechanical and structural drawing problems. Designing the interrelationship of mechanical parts is incorporated into this scale.

Mechanical drawings and diagrams concerning parts are included as well as the use of measuring and layout devices. Activities which include evaluation of the appearance of mechanical objects are part of the scale.

Scale #14

Mechanical Maintenance

Mechanical Maintenance includes activities such as locating or identifying the cause of a mechanical malfunction; maintaining or restoring proper mechanical functioning to equipment; and installing, regulating, and maintaining satisfactory output of mechanical devices.

Informational concerns of this scale are the quantity and quality of machine output, mechanical motion, and the interrelationship of mechanical parts applied in a maintenance context. The use of mechanical test equipment for maintenance purposes is part of the scale. Preventive maintenance, control information concerning mechanical devices, and overall mechanical functioning information are represented in the items. Diagnosing, adjusting, servicing, and repairing mechanical devices are component activities along with monitoring, installing, and fastening mechanical devices.

Scale #15

Medical and Related Activities

Medical and Related Activities is a well defined interest scale which includes the full gamut of activities normally perceived to be included in the medical profession. These activities are concerned with the prevention, diagnosis, and treatment of disease and physical illness in humans and animals.

This scale includes the conveyance of information (written and verbal) concerning the symptoms, feelings, activities and requests of patients and testing devices; graphical representations; nutrition; and state of health and hygiene. Goals concerning the reduction of potential or actual health problems are within the scope of this factor. Also goals dealing with health tests, causes of health problems, and health plans and communications are included.

The factor includes the application of all forms of medical treatment such as examinations, medicines, and physical and surgical treatments. The handling of medical materials and the establishment of therapeutic relationships with clients, patients, or animals are a part of this interest scale.

Scale #16

Environmental Communications

Environmental Communications include activities which involve communications to or from a remote location in the environment. The intent of the communications activities is often concerned with navigational or emergency situations. Visual or auditory signals can be part of the scale as well as visual and auditory signal codes. The location, direction of movement, and communication with air and water vehicles are represented by this dimension. Communications with work parties or individuals in environmentally remote locations of limited accessibility are included. Activities may involve the use of electronic communications equipment and systems or may involve only simple visual signaling devices.

Scale #17

Operation of Vehicles and Mechanized Equipment

This scale involves activities which include control precision, reaction time, and tracking as done in driving an automobile or other land, sea, or air vehicle. Hand- and foot-operated machines involving

tracking are included, as are all activities which require steering a moving object through a given space. The operation of light, medium, and heavy highway vehicles, such as automobiles, light trucks, and buses, and of heavy equipment such as earthmoving machines are part of this scale.

Scale #18

Performing Arts

This interest area encompasses the performance of artistic talents such as vocal and instrumental music, dramatic acting and reading, and dancing. The music-related components of this factor are knowledge of tonal quality and technique, selection of style, and understanding of musical notation. Reading and writing music are, therefore, common activities in the musical domain of this dimension.

Similarly, facial expressions, body movements, and voice characteristics of a performer are components of this factor relating to drama and dance.

Scale #19

Physical Coordination and Rush Situations

Physical Coordination and Rush Situations include activities that are done under pressure and must be completed quickly within limited time restrictions. Activities requiring casual, comfortable clothing for freedom of rapid movement are also included. General body coordination, multilimb coordination, and balance are components of the activities included in this factor. Situations such as attending to customers during rush hour fall within the scope of this scale.

Well coordinated body movement in emergency situations may be required in activities on this scale. Participation in athletic activities is also within the scope of this dimension.

Scale #20

Supervision and Organization of Work

This scale is concerned with the organization of goal-oriented activities and the direction of subordinates. Close as well as more general supervision related to evaluating and disciplining workers make up a large part of this scale. All types of personnel actions are involved which pertain to interrelationships with subordinates in a work situation.

Goals related to organizational plans and innovations and the satisfactory attainment of organizational performance are part of this scale, as are written communicational activities of an organizational nature.

Scale #21

Utilization of Numerical Data

This interest area is represented by the use of numerical information in the performance of routine job activities. The numerical information relates to the characteristics of things, events, or people and may frequently be displayed or presented in the form of tables, graphs, charts, balance sheets, and the like. It may also be either verbally communicated (e.g., phone numbers given, prices quoted), or recorded or transcribed (e.g., inventory counts posted, numbers entered on a keyboard, etc.).

Several aspects of this dimension are variable and thereby determine the complexity or importance of specific numerical information to a given job. The frequency of use of numbers may vary from negligible to continual; the complexity, from classification purposes only to imaginary and complex numbers; the use of numerical signs or symbols, from none at all to mathematical functional symbolism. The performance of numerical operations, such as solving standard arithmetic problems, is often involved in jobs which load heavily on this dimension; however, the calculations may vary widely from simple counting operations to high level mathematical operations (e.g., integration of functions).

Scale #22

Visual Arts

Individuals who score high on this dimension utilize several types of visual sensory information to produce aesthetic effects in the environment. Colors and color schemes are often major concerns represented by this scale, as are form and shape. Another type of activity represented by this scale is the location or arrangement of objects or people in space for aesthetic purposes. Sketches, graphic information, and models are frequently made in occupations relating to this dimension, thereby facilitating the completion of art or decorative plans, designs, or objects. Original art objects are sometimes produced in these occupations. Aesthetic judgment plays a prominent role in the mental requirements of this interest area, as does figural ingenuity (i.e., creative, resourceful, innovative, and flexible thinking pertaining to figures, objects, and figure or object systems).

APPENDIX B

EXAMPLES OF ITEMS WRITTEN FOR EACH OF THE 22 SCALES IN THE ORIGINAL VERSION OF THE VOCATIONAL ACTIVITY PREFERENCE PROFILE (VAPP-1)

Examples of Items Written for Each of the 22 Scales in the Original Version of the Vocational Activity Preference Profile (VAPP-1)

Scale 1: Agronomy

1. Cultivate the soil with a rake or hoe.
2. Cut or trim plants with a knife or clippers.
3. Take care of crops, trees, or shrubs.
4. Make plans to plant trees or shrubs.
5. Find out about water supplies for crops.

Scale 2: Animal Care and Training

1. Comb or brush the hair of animals.
2. Train animals to do tricks.
3. Judge animal shows.
4. Feed animals.
5. Raise race horses or show dogs.

Scale 3: Assembly

1. Put together small objects such as cameras.
2. Test factory-made objects for safety.
3. Sew garment pieces together to make clothing.
4. Bolt or glue together parts of objects.
5. Put furniture together.

Scale 4: Chemical Activities

1. Use chemical symbols and abbreviations.
2. Measure the characteristics of materials such as their freezing and boiling temperature.
3. Work with chemicals.
4. Weigh chemicals on very accurate scales.
5. Study the chemistry of plants and animals.

Scale 5: Clerical Activities

1. Take dictation.
2. Place cards or files in alphabetical order.
3. Type business letters.
4. Check written material for errors in grammar.
5. Operate an office copying machine.

Scale 6: Construction

1. Paint the outside and inside walls of houses.
2. Construct something in a special shape such as a home swimming pool.
3. Put a roof on a new house.
4. Build a wall with bricks or stone.
5. Install plumbing fixtures in a new house.

Scale 7: Customer Sales and Services

1. Satisfy the requests of customers.
2. Collect money and make change for customers.
3. Encourage customers to come back and buy more goods.
4. Persuade customers to buy a product.
5. Show merchandise to customers.

Scale 8: Electrical and Electronic Assembly and Maintenance

1. Find out why electrical devices fail to work properly.
2. Put together electrical devices.
3. Adjust electrical devices.
4. Read about basic principles of electricity.
5. Test electrical equipment and parts.

Scale 9: Food Preparation

1. Prepare balanced meals for large groups of people.
2. Cook on a grill in a cafe or diner.
3. Bake and decorate pastries and desserts.
4. Select and buy fresh food for a restaurant.
5. Keep cooking or food storage areas clean.

Scale 10: Human Assessment and Interpersonal Relations

1. Settle disagreements between groups of people.
2. Help other people in solving their problems.
3. Determine moods or attitudes of individuals.
4. Describe events involving people.
5. Explain the behavior of another person.

Scale 11: Ideational Activities

1. Put ideas into words quickly and easily.
2. Produce a lot of ideas on a certain subject.
3. Think of the details needed in a complicated plan.
4. Remember facts about things that have happened.
5. Determine the causes and effects of problems.

Scale 12: Instruction

1. Teach a course to help others understand a subject.
2. Help a person develop a talent or skill.
3. Manage a laboratory for students.
4. Test a person's knowledge of a subject.
5. Use a film or slide projector while lecturing.

Scale 13: Mechanical and Structural Drawing

1. Prepare mechanical drawings and blueprints.
2. Write reports about mechanical subjects.
3. Think of the details needed for a complicated plan.
4. Make drawings using rulers and drawing compasses.
5. Use drawings to obtain information about mechanical parts.

Scale 14: Mechanical Maintenance

1. Find out why machines break down.
2. Fix machines that are broken down.
3. Install parts of machines.
4. Find out the quality of the items a machine produces.
5. Adjust and tune machines.

Scale 15: Medical and Related Activities

1. Use devices to do tests on sick people and animals.
2. Look at X-rays of patients.
3. Apply medicine to people or animals.
4. Examine people or animals to determine their health.
5. Use medical equipment to help cure human or animal patients.

Scale 16: Navigation and Navigational Communications[a]

1. Operate radar on a ship.
2. Use a two-way radio to report an emergency.
3. Send radio messages to taxi drivers to pick up passengers.
4. Use hand signals to direct large airplanes on an airport runway.
5. Operate a car telephone.

Scale 17: Operation of Vehicles and Mechanized Equipment

1. Steer a car.
2. Control a vehicle or machine using both hands.
3. Operate heavy equipment vehicles.
4. Drive a large bus.
5. Operate a clutch, brake, and gas pedal.

Scale 18: Performing Arts

1. Sing in a chorus or vocal group.
2. Act in a play on stage.
3. Direct an orchestra or choir.
4. Play an instrument in a band, combo, or orchestra.
5. Dance on stage in front of an audience.

Scale 19: Physical Coordination and Rush Situations[b]

1. Complete tasks that must be done quickly.
2. Finish a job by some required time.
3. Wear casual, comfortable clothing.
4. Move with quick and accurate body coordination.
5. Use both arms or legs at the same time to complete a task.

Scale 20: Supervision and Organization of Work[c]

1. Supervise the work of others to get a job done.
2. Rate the performance of others on the job.
3. Watch over employees closely to check the quality of their work.
4. Encourage others to do their best work.
5. Encourage others to work hard.

Scale 21: Utilization of Numerical Data[c]

1. Solve simple written problems in arithmetic.
2. Use numbers on graphs or charts.
3. Add up totals for long columns of numbers.
4. Figure out percentages.
5. Use numbers to supply others with information.

Scale 22: Visual Arts[c]

1. Produce pleasing combinations of colors.
2. Draw sketches of people or objects.
3. Judge the quality or value of a work of art.
4. Design fashionable clothing.
5. Decorate the entire inside of a house.

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[a]The title of Scale 16 was changed to "Environmental Communications" in the second version of the Vocational Activity Preference Profile (VAPP-2).

[b]Scale 19 was eliminated in the second version of the Vocational Activity Preference Profile (VAPP-2).

[c]Scales 20-22 in the first version of the Vocational Activity Preference Profile (VAPP-1) became Scales 19-21 in the second version (VAPP-2), upon elimination of Scale 19 (Physical Coordination and Rush Situations).

APPENDIX C

SCALE AND ITEM DATA OBTAINED FROM THE ITEM READABILITY RATINGS, ITEM-SCALE SORTS, AND ITEM-SCALE CONGRUENCE RATINGS

The readability index assigned to each item was based on the student interviews and is shown in column 1 of Table 19. A scale of one to five was used with a value of five representing no reading or comprehension problem of any kind by any student with the item; a value of one indicated a reading problem by every student who was interviewed. Items with a readability index of three or less were either revised or eliminated.

Entries in the Consistency column of Table 19 represent the number of times each item was assigned by judges to the scale for which it was written. Judges were given scale descriptions similar to those shown in Appendix A, along with a list of the items. They were given no indication of the scales for which the items were written. Since there were 10 judges, a value of 10 represents correct scale assignment for the item by all 10 judges. Items with a consistency value of less than eight were either revised or eliminated. Table 20 presents data on the misassignments of items to scales.

The Rating column in Table 19 contains the mean "closeness of fit" item ratings for nine judges on a zero-to-five scale according to the rating instructions shown on the following page. Each rater was given the scale descriptions along with each item and the scale number for which the item was written. Items whose mean ratings were less than 4.00 were revised or eliminated.

Instructions to Item-Scale Congruence Raters

Taking each scale at a time, please consider each individual item on the scale with respect to its closeness of fit with that scale's description. Using a six-point scale (see below), rate each item:

0 - does not fit at all

1 - fits only in a generalized sense

2 - fits to a limited degree

3 - fits to a moderate degree

4 - fits to a considerable degree

5 - fits precisely

The scale number and item number are found on the lower right corner on the back of each card. This ID number has four digits: the first two digits represent the scale number; the second two digits, the item number.

Using a sheet of keypunch coding paper, place the ratings for each item in a matrix of scale numbers (1 - 22, vertical) by item numbers (1 - 20, horizontal). The ratings for item 12 on scale 14, for example, would be entered in the cell corresponding to row 14 (scale) and column 12 (item). The number of items per scale varies from 14 to 18, so there will not be the same number of entries on each row of the matrix.

Table 19

Summary of Item Readability Ratings, Item-Scale Sorts, and Item-Scale Congruence Ratings

Scale 1				Scale 2			
ITEM	READA-BILITY	CONSIS-TENCY	MEAN RATING	ITEM	READA-BILITY	CONSIS-TENCY	MEAN RATING
1	5	10	4.89	1	5	10	5.00
2	5	4*	5.00	2	5	10	5.00
3	5	10	5.00	3	5	10	5.00
4	3*	10	4.78	4	5	10	5.00
5	5	10	5.00	5	5	10	4.89
6	4	10	4.44	6	5	9	4.44
7	5	10	4.44	7	5	10	4.78
8	5	10	4.89	8	5	10	3.11*
9	5	10	3.44*	9	5	10	5.00
10	5	10	4.55	10	3*	10	4.00
11	5	10	4.78	11	5	10	4.33
12	3*	10	4.67	12	5	10	5.00
13	5	10	4.89	13	5	10	5.00
14	5	10	4.11	14	5	10	5.00
15	4	9	3.89*	15	5	9	4.44
16	5	10	2.00*				
17	4	10	5.00				
18	3*	10	5.00				

Scale 3				Scale 4			
ITEM	READA-BILITY	CONSIS-TENCY	MEAN RATING	ITEM	READA-BILITY	CONSIS-TENCY	MEAN RATING
1	5	8	4.22	1	5	10	5.00
2	5	10	4.67	2	4	10	4.78
3	5	10	4.44	3	3*	10	5.00
4	5	4*	2.44*	4	5	10	4.78
5	5	8	3.56*	5	5	10	4.22
6	5	8	4.33	6	3*	10	4.89
7	5	8	4.67	7	5	8	4.56
8	3*	10	4.89	8	5	10	4.89
9	5	2*	2.44*	9	5	9	4.33
10	5	6*	3.66*	10	5	10	5.00
11	5	10	4.44	11	5	10	5.00
12	5	10	4.67	12	5	10	5.00
13	5	10	4.89	13	4	8	4.33
14	5	4*	4.67	14	5	10	4.78
15	5	0*	1.89*	15	4	10	3.89*
				16	3*	10	5.00

Table 19 (continued)

Scale 5				Scale 6			
ITEM	READA-BILITY	CONSIS-TENCY	MEAN RATING	ITEM	READA-BILITY	CONSIS-TENCY	MEAN RATING
1	5	10	4.89	1	5	4*	1.55*
2	4	10	5.00	2	3*	9	2.44*
3	5	10	5.00	3	5	10	5.00
4	5	10	5.00	4	5	10	5.00
5	5	10	5.00	5	3*	10	5.00
6	5	9	4.55	6	5	8	4.67
7	2*	10	5.00	7	5	10	5.00
8	5	10	5.00	8	5	10	5.00
9	5	10	5.00	9	5	10	4.78
10	5	9	5.00	10	5	10	5.00
11	5	10	5.00	11	5	10	5.00
12	5	10	5.00	12	5	10	5.00
13	5	7*	4.55	13	3*	10	5.00
14	3*	10	5.00	14	3*	10	2.55*
15	3*	10	4.78				
16	5	5*	4.00				
17	5	10	5.00				

Scale 7				Scale 8			
ITEM	READA-BILITY	CONSIS-TENCY	MEAN RATING	ITEM	READA-BILITY	CONSIS-TENCY	MEAN RATING
1	5	10	5.00	1	5	10	5.00
2	5	9	5.00	2	5	10	5.00
3	5	8	4.44	3	5	10	5.00
4	5	9	4.44	4	5	10	5.00
5	5	10	4.44	5	5	10	5.00
6	5	0*	2.67*	6	5	10	5.00
7	5	10	5.00	7	3*	10	4.89
8	5	10	5.00	8	5	10	4.89
9	5	9	4.55	9	2*	10	5.00
10	5	10	4.89	10	5	1*	3.44*
11	5	10	4.55	11	5	10	3.88*
12	5	10	5.00	12	5	10	5.00
13	5	10	4.78	13	2*	10	4.33
14	5	10	4.78	14	5	10	4.00
15	5	10	5.00	15	3*	10	5.00

Table 19 (continued)

Scale 9				Scale 10			
ITEM	READA-BILITY	CONSIS-TENCY	MEAN RATING	ITEM	READA-BILITY	CONSIS-TENCY	MEAN RATING
1	5	10	4.89	1	5	10	5.00
2	5	6*	3.67*	2	5	10	5.00
3	5	10	4.89	3	5	10	5.00
4	5	10	4.89	4	5	6*	4.89
5	5	10	4.78	5	5	10	5.00
6	5	10	4.67	6	3*	8	4.89
7	5	10	4.78	7	5	10	4.33
8	5	10	4.89	8	5	10	5.00
9	5	10	4.89	9	3*	8	4.78
10	5	10	4.44	10	5	9	5.00
11	5	10	4.89	11	5	9	4.55
12	5	10	4.89	12	3*	7*	4.89
13	5	10	4.55	13	5	6*	4.33
14	5	10	4.78	14	5	5*	4.33
15	5	10	4.89	15	5	10	4.89
16	5	10	4.67	16	5	8	4.78

Scale 11				Scale 12			
ITEM	READA-BILITY	CONSIS-TENCY	MEAN RATING	ITEM	READA-BILITY	CONSIS-TENCY	MEAN RATING
1	5	10	5.00	1	3*	10	5.00
2	4	10	5.00	2	5	10	5.00
3	5	10	5.00	3	5	10	5.00
4	5	6*	5.00	4	5	6*	5.00
5	5	9	4.89	5	5	9	4.89
6	5	9	4.55	6	5	8	4.33
7	5	0*	3.89*	7	5	10	5.00
8	2*	8	4.33	8	5	8	4.78
9	5	7*	4.67	9	5	2*	4.33
10	2*	9	4.89	10	5	8	4.89
11	5	9	4.67	11	3*	10	5.00
12	5	9	4.89	12	5	10	5.00
13	5	6	4.55	13	5	10	5.00
14	5	2*	4.22	14	5	7*	2.67*
15	5	10	4.67	15	5	2*	3.89*
16	3*	10	5.00	16	4	10	5.00

Table 19 (continued)

Scale 13				Scale 14			
ITEM	READABILITY	CONSISTENCY	MEAN RATING	ITEM	READABILITY	CONSISTENCY	MEAN RATING
1	5	9	4.44	1	5	10	5.00
2	5	10	5.00	2	5	10	5.00
3	5	2*	3.78*	3	5	10	5.00
4	5	9	4.00	4	5	8	5.00
5	5	7*	4.00	5	5	10	4.67
6	3*	5*	3.55*	6	5	10	4.89
7	5	6*	4.89	7	5	8	4.44
8	5	6*	4.78	8	5	10	5.00
9	5	8	4.55	9	5	7*	4.78
10	5	10	5.00	10	5	10	5.00
11	5	10	5.00	11	5	10	5.00
12	5	6*	4.78	12	5	6*	4.67
13	5	2*	4.00	13	5	10	5.00
14	5	3*	3.89*	14	5	7*	4.67
15	5	4*	3.89*				
16	5	1*	3.89*				
17	5	6*	3.67*				
18	3*	5*	3.33*				

Scale 15				Scale 16			
ITEM	READABILITY	CONSISTENCY	MEAN RATING	ITEM	READABILITY	CONSISTENCY	MEAN RATING
1	5	10	5.00	1	3*	10	5.00
2	5	10	5.00	2	3*	9	5.00
3	5	9	4.55	3	5	10	4.89
4	5	9	4.55	4	5	10	5.00
5	5	9	5.00	5	5	10	5.00
6	5	10	5.00	6	5	6*	4.89
7	5	10	5.00	7	5	10	4.22
8	5	9	4.78	8	5	10	4.22
9	5	9	4.78	9	3*	10	4.22
10	5	10	5.00	10	5	10	4.44
11	5	10	5.00	11	4	10	4.33
12	5	10	5.00	12	3*	10	5.00
13	5	10	5.00	13	4	10	5.00
14	5	10	5.00				
15	3*	10	4.44				
16	5	10	5.00				

Table 19 (continued)

Scale 17				Scale 18			
ITEM	READA-BILITY	CONSIS-TENCY	MEAN RATING	ITEM	READA-BILITY	CONSIS-TENCY	MEAN RATING
1	5	10	5.00	1	5	10	5.00
2	4	9	5.00	2	5	10	5.00
3	5	1*	3.55*	3	5	10	5.00
4	5	6*	4.11	4	5	10	5.00
5	5	9	4.67	5	5	10	5.00
6	5	9	4.67	6	5	10	5.00
7	5	10	5.00	7	5	10	5.00
8	4	10	5.00	8	5	9	4.78
9	5	10	5.00	9	5	9	4.78
10	5	10	5.00	10	5	10	5.00
11	5	10	4.78	11	5	10	5.00
12	5	5*	3.89*	12	5	10	5.00
13	5	10	4.78	13	5	8	2.78*
				14	5	8	2.78*
				15	5	8	3.67*

Scale 19				Scale 20			
ITEM	READA-BILITY	CONSIS-TENCY	MEAN RATING	ITEM	READA-BILITY	CONSIS-TENCY	MEAN RATING
1	5	10	4.78	1	5	10	5.00
2	5	10	4.11	2	5	10	4.78
3	5	10	4.00	3	5	9	5.00
4	5	10	4.55	4	5	7*	4.55
5	4	9	5.00	5	4	8	5.00
6	5	10	5.00	6	4	10	5.00
7	3*	8	4.78	7	5	7*	4.78
8	5	10	5.00	8	5	8	4.44
9	5	8	4.22	9	5	9	4.55
10	5	10	4.55	10	5	10	4.33
11	5	8	4.67	11	3*	9	4.89
12	5	10	4.44	12	3*	8	4.55
13	5	8	3.22*	13	4	8	4.44
14	5	5*	3.11*	14	5	6*	4.78
				15	3*	9	4.87

Table 19 (continued)

Scale 21				Scale 22			
ITEM	READABILITY	CONSISTENCY	MEAN RATING	ITEM	READABILITY	CONSISTENCY	MEAN RATING
1	5	10	5.00	1	5	10	5.00
2	5	10	4.89	2	5	10	5.00
3	2*	7*	4.44	3	5	10	4.89
4	3*	9	4.89	4	5	6*	4.78
5	5	9	4.89	5	5	9	5.00
6	5	5*	4.44	6	4	9	4.44
7	5	10	4.89	7	5	10	5.00
8	5	8	5.00	8	5	4*	4.11
9	5	7*	4.78	9	5	4*	4.11
10	5	6*	4.55	10	5	10	4.67
11	5	10	5.00	11	5	10	4.67
12	5	10	5.00	12	5	9	4.78
13	2*	10	5.00	13	5	10	4.78
14	5	5*	5.00	14	5	10	5.00
15	5	10	4.67	15	5	10	5.00
16	5	10	5.00	16	3*	9	4.44
17	3*	10	5.00				
18	3*	10	5.00				

*Did not meet minimum acceptable criterion; item was either revised or eliminated.

Table 20

Judges' Misassignments of Items to Scales

SCALE NO.	ITEM NO.	NUMBER TIMES MISASSIGNED	SCALE TO WHICH MISASSIGNED
1	2	6	17
1	15	1	16
2	15	1	22
2	14	1	15
3	1	2	8
3	4	6	14
3	5	2	6
3	6	1	14
		1	22
3	7	1	6
		1	14
3	9	1	8
		7	14
3	10	4	14
3	14	6	14
3	15	10	14
4	7	1	6
		1	9
4	9	1	11
4	13	2	1
5	6	1	4
5	10	1	21
5	13	3	21
5	16	5	21
6	1	6	13
6	2	1	13
6	6	2	22
7	2	1	11
7	3	1	9
		1	19
7	4	1	9
7	6	1	5
		8	11
		1	22
7	9	1	4
8	10	9	16
9	2	4	15
10	4	1	15
		1	18
		2	19
10	6	1	11
		1	12
10	9	1	11
		1	12
10	10	1	11
10	11	1	11
10	12	3	21
10	13	2	11
		2	20
10	14	4	7
		1	20
10	16	2	11
11	4	3	10
		1	21
11	5	1	20
11	7	10	10
11	8	1	10
		1	21
11	9	3	20
11	10	1	10
11	11	1	12
11	12	1	12
11	13	3	10
		1	21
11	14	8	20
12	4	2	11
		1	13
		1	14
12	6	2	20
12	8	2	10
12	9	8	10
12	10	1	19
		1	22
12	14	3	10
12	15	8	10
13	1	1	11
13	3	1	3
		7	14
13	4	1	14
13	5	3	6
13	6	1	3
		4	14
13	7	4	21
13	8	4	21
13	9	1	11
		1	22
13	12	4	14
13	13	8	14
13	14	7	14
13	15	1	3
		5	14
13	16	3	3
		6	14
13	17	3	11
		1	21
13	18	3	11
		1	12
		1	14
14	4	1	3
		1	12

Table 20 (continued)

SCALE NO.	ITEM NO.	NUMBER TIMES MISASSIGNED	SCALE TO WHICH MISASSIGNED
14	7	2	3
14	9	2	13
		1	21
14	12	1	3
		2	6
		1	13
14	14	1	3
		2	21
15	3	1	9
15	4	1	9
15	5	1	13
15	8	1	11
15	9	1	11
16	2	1	17
16	6	1	10
		3	19
17	2	1	19
17	3	9	19
17	4	4	16
17	5	1	19
17	6	1	19
17	12	5	16
18	8	1	11
18	9	1	11
18	13	2	11
18	14	2	11
18	15	1	11
		1	22
19	5	1	18
19	7	2	17
19	9	2	7
19	11	1	10
		1	15
19	13	1	5
		1	10
19	14	3	10
		1	11
		1	20
20	3	1	10
20	4	2	10
		1	12
20	5	2	10
20	7	3	10
20	8	1	10
		1	12
20	9	1	10
20	11	1	11
20	12	1	11
		1	21
20	13	1	11
		1	21
20	14	4	10
20	15	1	11
21	3	1	4
		2	5
21	4	1	5
21	5	1	7
21	6	1	4
		3	5
		1	7
21	8	2	5
21	9	3	5
21	10	4	5
21	14	1	4
		4	5
22	4	4	1
22	5	1	13
22	6	1	13
22	8	1	3
		2	6
		3	13
22	9	1	6
		5	13
22	12	1	6
22	16	1	11

APPENDIX D

INSTRUCTIONS AND RESPONSE FORMAT USED WITH THE INITIAL FORM OF THE VOCATIONAL ACTIVITY PREFERENCE PROFILE (VAPP-1)

INSTRUCTIONS

(1) Turn both answer sheets so that the name grids are in the upper right corners. Print your name (last name first, then first name and middle initial) in the spaces provided on both sheets. After this, darken the boxes corresponding to each letter in your name on BOTH sheets.

(2) On the top answer sheet, darken box "A" in the space marked "FORM OF THIS TEST IS"; on the bottom answer sheet, darken box "B" under "FORM OF THIS TEST IS."

(3) On BOTH answer sheets in the space marked "1 2 3 4 5 6" just beneath the space for form of test, print in spaces 1-3 the I.D. number printed in the upper right corner of this test sheet. Next, darken the boxes corresponding to these numbers on BOTH sheets.

(4) In the space marked "Sex" on BOTH sheets print a "B" if boy, or "G" if girl, then darken the corresponding boxes.

(5) Turn answer sheet A so that the name grid is at the top left. Mark your responses to item numbers 1 through 160 on this sheet; then continue on answer sheet B by placing your responses to item 161 in space 1, your response to item 162 in space 2, and so on until you have completed all of the questionnaire items. The last entry you make on answer sheet B will be number 80 which represents questionnaire item number 240.

(6) Each item describes a work activity which occurs in the performance of various jobs. Indicate how you feel about each activity. Throughout the inventory, do not take into consideration what training or education you might lack; simply indicate how you feel about performing each activity assuming you had the needed training or education.

(7) Use the following rules in making your choices:

Fill in Box "A" if you feel that you would LIKE to perform the activity.

Fill in box "B" if you have no opinion about the activity; that is, if you do not care one way or the other or, if you cannot decide about the activity.

Fill in box "C" if you feel that you would NOT LIKE to perform the activity.

Boxes labeled "D" and "E" will not be used. DO NOT MARK IN THESE BOXES.

(8) Use a No. 2 pencil and be careful to darken the boxes heavily and completely. Erase any stray marks or errors thoroughly. Please complete every item.

APPENDIX E

RESPONSE DISTRIBUTIONS AND MEAN RESPONSE VALUES FOR THE VAPP-1 ITEMS

Table 21

Response Distributions and Mean Response Values for the VAPP-1 Items

Item Number	Response Position: Percent LIKE	Percent No Opinion	Percent NOT LIKE	Mean Response[a]
1	78	16	6	2.72
2	11	23	66	1.45
3	36	33	31	2.05
4	11	17	71	1.39
5	50	28	22	2.28
6	63	25	12	2.51
7	69	23	8	2.61
8	86	11	3	2.83
9	49	33	18	2.31
10	36	33	31	2.05
11	33	32	35	1.98
12	50	24	26	2.24
13	51	25	23	2.26
14	18	37	45	1.73
15	23	38	39	1.84
16	43	29	28	2.15
17	45	36	19	2.26
18	12	29	59	1.53
19	52	26	22	2.30
20	66	25	9	2.57
21	23	40	37	1.86
22	61	33	6	2.55
23	43	35	22	2.21
24	29	33	38	1.91
25	28	25	47	1.81
26	46	33	21	2.25
27	59	26	15	2.44
28	34	43	23	2.11
29	5	25	70	1.35
30	65	26	9	2.56
31	66	22	12	2.54
32	59	30	11	2.48
33	24	31	45	1.79
34	25	45	30	1.95
35	36	32	32	2.04
36	36	27	37	1.99
37	9	36	55	1.54
38	30	16	54	1.76
39	32	29	39	1.93
40	50	35	15	2.35

Table 21 (continued)

Item Number	Response Position: Percent LIKE	Percent No Opinion	Percent NOT LIKE	Mean Response[a]
41	20	33	47	1.73
42	56	28	16	2.40
43	74	22	4	2.70
44	29	45	26	2.03
45	36	28	35	1.99
46	3	21	76	1.27
47	12	35	53	1.59
48	68	28	4	2.64
49	31	15	4	2.77
50	25	30	45	1.80
51	26	43	31	1.95
52	17	39	44	1.73
53	40	33	27	2.13
54	59	33	8	2.51
55	71	23	6	2.65
56	55	34	11	2.44
57	18	20	62	1.56
58	43	21	36	2.07
59	47	21	32	2.15
60	10	32	58	1.52
61	61	21	18	2.43
62	19	34	47	1.72
63	21	43	36	1.85
64	66	19	15	2.51
65	33	34	33	2.00
66	19	32	49	1.70
67	11	22	67	1.44
68	39	33	28	2.11
69	70	21	9	2.61
70	41	38	21	2.20
71	14	32	54	1.60
72	22	30	48	1.74
73	50	28	22	2.28
74	20	44	36	1.84
75	71	22	7	2.64
76	55	35	10	2.45
77	14	23	63	1.51
78	28	35	37	1.91
79	75	21	4	2.71
80	41	26	33	2.08
81	43	35	22	2.21
82	42	32	26	2.16

Table 21 (continued)

Item Number	Response Position: Percent LIKE	Percent No Opinion	Percent NOT LIKE	Mean Response[a]
83	46	35	19	2.27
84	33	30	37	1.96
85	23	31	46	1.77
86	23	21	56	1.67
87	32	30	38	1.94
88	41	30	29	2.12
89	22	31	47	1.75
90	91	8	1	2.90
91	25	23	52	1.73
92	22	31	47	1.75
93	11	24	65	1.46
94	34	26	40	1.94
95	43	30	27	2.16
96	79	16	5	2.74
97	85	4	11	2.74
98	35	40	25	2.10
99	22	30	48	1.74
100	25	33	42	1.83
101	31	32	37	1.94
102	42	27	31	2.11
103	14	34	52	1.62
104	12	26	62	1.50
105	32	31	37	1.95
106	35	28	37	1.98
107	32	37	31	2.01
108	55	26	19	2.36
109	74	16	10	2.64
110	32	35	33	1.99
111	38	34	28	2.10
112	23	44	33	1.90
113	25	41	34	1.91
114	24	32	44	1.80
115	50	18	32	2.18
116	29	36	35	1.94
117	35	31	34	2.01
118	77	18	5	2.72
119	60	27	13	2.47
120	59	24	17	2.42
121	45	31	24	2.21
122	61	24	15	2.46
123	27	22	51	1.76
124	24	36	40	1.84

Table 21 (continued)

Item Number	Response Position: Percent LIKE	Percent No Opinion	Percent NOT LIKE	Mean Response[a]
125	19	30	51	1.68
126	44	27	29	2.15
127	10	16	74	1.36
128	68	18	14	2.54
129	23	43	34	1.89
130	36	29	35	2.01
131	3	9	88	1.15
132	18	31	51	1.67
133	46	24	29	2.17
134	13	35	52	1.61
135	13	26	61	1.52
136	57	31	12	2.45
137	87	8	5	2.82
138	21	36	43	3.78
139	33	24	43	1.90
140	3	15	82	1.21
141	16	33	51	1.65
142	38	35	27	2.11
143	79	14	7	2.72
144	47	34	19	2.28
145	16	31	53	1.63
146	46	27	27	2.19
147	35	31	34	2.01
148	41	25	34	2.07
149	27	24	49	1.78
150	7	21	72	1.35
151	31	36	33	1.98
152	30	33	37	1.93
153	63	22	15	2.48
154	22	33	45	1.77
155	32	31	37	1.95
156	10	16	74	1.36
157	26	41	33	1.93
158	78	16	6	2.72
159	55	32	13	2.42
160	13	28	59	1.54
161	46	34	20	2.26
162	35	37	28	2.07
163	26	30	44	1.82
164	74	19	7	2.67
165	81	16	3	2.78
166	6	14	80	1.26

Table 21 (continued)

Item Number	Response Position: Percent LIKE	Percent No Opinion	Percent NOT LIKE	Mean Response[a]
167	20	23	57	1.63
168	50	27	23	2.27
169	30	27	43	1.87
170	25	33	42	1.83
171	67	23	10	2.57
172	51	26	23	2.28
173	19	26	55	1.64
174	29	14	57	1.72
175	26	31	43	1.83
176	26	25	49	1.77
177	60	20	20	2.40
178	14	25	61	1.53
179	59	27	14	2.45
180	14	24	62	1.52
181	30	25	45	1.85
182	19	26	55	1.64
183	25	32	43	1.82
184	67	24	9	2.58
185	47	34	19	2.28
186	72	21	7	2.65
187	35	36	29	2.06
188	26	34	40	1.86
189	27	35	38	1.89
190	51	25	24	2.27
191	38	23	39	1.99
192	18	26	56	1.62
193	14	29	57	1.57
194	39	21	40	1.99
195	41	28	31	2.10
196	37	39	24	2.13
197	40	32	28	2.12
198	64	24	12	2.52
199	30	25	45	1.85
200	43	39	18	2.25
201	17	40	43	1.74
202	30	33	37	1.93
203	21	36	43	1.78
204	21	20	59	1.62
205	26	45	29	1.97
206	34	22	44	1.90
207	66	27	7	2.59
208	33	24	43	1.90

Table 21 (continued)

Item Number	Response Position: Percent LIKE	Percent No Opinion	Percent NOT LIKE	Mean Response[a]
209	58	21	21	2.37
210	27	33	40	1.87
211	43	27	30	2.13
212	14	22	64	1.50
213	25	17	58	1.67
214	12	27	61	1.51
215	53	22	25	2.28
216	36	33	31	2.05
217	70	21	9	2.61
218	6	19	75	1.31
219	20	27	53	1.67
220	49	18	33	2.16
221	56	27	17	2.39
222	8	13	79	1.29
223	13	30	57	1.56
224	78	12	10	2.68
225	50	23	27	2.23
226	16	35	49	1.67
227	32	25	43	1.89
228	60	24	16	2.44
229	61	19	20	2.41
230	38	19	43	1.95
231	23	29	48	1.75
232	40	28	32	2.08
233	28	28	44	1.84
234	25	27	48	1.77
235	15	31	54	1.61
236	44	27	29	2.15
237	45	31	24	2.21
238	35	24	40	1.95
239	18	25	56	1.62
240	61	20	19	2.43

[a] A "LIKE" response was assigned a value of "3," a "No Opinion" response a value of "2," and a "NOT LIKE" response a value of "1."

APPENDIX F

CORRELATIONS BETWEEN VAPP-1 ITEMS AND THEIR INTENDED SCALES

Table 22

Correlations Between VAPP-1 Items and Their Intended Scales[a]

Scale 1		Scale 2		Scale 3		Scale 4		Scale 5		Scale 6		Scale 7	
Item #	r	Item #	r	Item #	r	Item #	r	Item #	r	Item #	r	Item #	r
162	.53	229[b]	.64	57[d]	.08	39	.62	47[b]	.43	119	.47	29[b]	.37
24	.58	17	.65	44[e]	.51	129[b]	.62	182[b]	.50	32	.53	52[b]	.42
51	.61	87	.73	21	.55	80	.64	4	.56	86	.57	150[b]	.42
190	.62	176	.73	130	.61	3	.65	37	.57	104	.59	140	.43
113	.65	59	.74	178	.63	216	.66	127	.58	15	.61	14	.54
12	.67	239[c]	.74	219	.67	92	.71	214	.59	60	.61	192	.54
73	.70	211	.78	145	.70	66	.76	135	.61	208	.64	225	.59
139	.70	36	.81	89	.73	181	.78	223	.62	193	.66	72	.60
101	.72	147	.81	110	.75	155	.82	235	.62	148	.68	161	.60
202	.78	195	.83	199	.75	169	.83	77	.64	175	.74	117	.64
		106	.84			233	.87	166	.68			103	.68
		123	.84					93	.74			206	.73
												234	.74

NOTE -- Before a correlation was computed, an item's contribution to the total scale score was removed by subtracting the subjects' responses to the item from their total scale scores.

[a]Scale 19 and its items were eliminated because of low reliability.

[b]Excess item with lowest item-scale correlation; item was eliminated.

[c]Item too similar to item 123; both items begin "trim the"; item was eliminated and replaced with a new item.

Table 22 (continued)

Scale 8		Scale 9		Scale 10		Scale 11		Scale 12		Scale 13		Scale 14	
Item #	r	Item #	r	Item #	r	Item #	r	Item #	r	Item #	r	Item #	r
25	.61	222[b]	.40	42	.57	49[d]	.24	33	.34	5	.57	62[b]	.64
10	.68	2	.44	20	.64	164[g]	.42	95	.37	212	.59	23	.68
74	.68	91	.44	217	.64	207	.43	122	.47	125	.60	11	.69
203	.77	131[f]	.53	198	.66	75	.44	165	.49	35	.64	173	.74
99	.81	46	.54	55	.73	30	.45	136	.56	65	.64	201	.77
138	.82	78	.55	143	.73	8[h]	.50	6	.59	154	.68	84	.82
50	.84	41	.56	158	.75	186	.54	76	.61	81	.69	100	.82
114	.89	236	.58	109	.78	224	.55	159	.62	94	.79	151	.82
163	.89	219	.59	128	.79	97[h]	.65	48	.63	170	.79	112	.84
188	.91	180	.64	69	.85	118	.70	184	.77	183	.84	231	.84
		134	.67			137[h]	.73					189	.87
		167	.69										

[d]Item-scale correlation <.30; item was eliminated.

[e]Low face validity; item was eliminated.

[f]Item elicited over 84% "Not Like" responses; item was eliminated.

[g]Item was eliminated through clerical error and replaced by a new item.

Table 22 (continued)

Scale 15		Scale 16		Scale 17		Scale 18		Scale 19[a]		Scale 20		Scale 21		Scale 22	
Item #	r	Item #	r	Item #	r	Item #	r	Item #	r	Item #	r	Item #	r	Item #	r
26[b]	.44	9[i]	.35	54	.40	61[b]	.41	90	.19	68	.50	160[b]	.49	96[b]	.39
228[b]	.50	205[i]	.49	18	.57	27[b]	.51	43	.23	45	.51	194	.52	82	.46
40[b]	.51	83[i]	.62	70	.58	13	.56	67	.31	56	.52	34	.53	209[e]	.48
126	.60	63	.63	38	.68	149	.57	156	.32	111	.53	53	.54	7	.48
58	.63	28	.64	141	.68	174	.67	1	.36	22	.54	121	.56	185	.52
88	.63	98[i]	.70	124	.70	191	.70	179	.41	132	.67	71	.58	31	.60
19	.69	152[i]	.71	213	.74	204	.71	79	.45	157	.71	16	.59	153	.61
215	.69	116[i]	.74	107	.75	115	.74	168	.48	221	.71	226	.61	120	.63
240	.70	172[i]	.76	227	.77	230	.74	133	.50	200	.74	141	.69	232	.64
177	.78	187	.76	196	.79	85	.77	220	.52	144	.80	105	.70	237	.64
197	.78					238	.79					210	.71	171	.65
108	.82					102	.80							64	.70
146	.82														

[h]Item elicited over 84% "Like" responses; item was eliminated and replaced by a new item.

[i]The definition of Scale 16 was revised following administration of the VAPP-1. The indicated item was not congruent with the revised definition and was therefore eliminated and replaced by a new item.

APPENDIX G

ITEM-SCALE CORRELATIONS FOR THE 15 VAPP-1 ITEMS WHOSE CORRELATIONS WITH UNINTENDED SCALES EXCEEDED THE CORRELATIONS WITH THEIR CORRECTED INTENDED SCALES

Table 23

Item-Scale Correlations for the 15 Items Whose Correlations with Unintended Scales Exceeded the Correlations with Their Corrected Intended Scales

Item Number	Intended Scale	$\underline{r}$ with Intended Scale[b]	Unintended Scale	Highest $\underline{r}$ with Unintended Scale	Used in VAPP-2
199[a]	3	.75(.82)	14	.77	Yes
219[a]	3	.67(.75)	14	.72	Yes
89[a]	3	.73(.79)	14	.74	Yes
130[a]	3	.61(.70)	6	.68	Yes
44[a]	3	.51(.61)	17	.57	No
57	3	.08(.22)	9	.38	No
47	5	.43(.53)	3	.55	No
29[a]	7	.37(.45)	9	.38	No
203[a]	8	.77(.82)	14	.82	Yes
33[a]	12	.34(.50)	18	.38	Yes
95[a]	12	.37(.53)	16	.40	Yes
65[a]	13	.64(.72)	14	.68	Yes
212[a]	13	.59(.67)	14	.62	Yes
220[a]	19	.52(.69)	20	.55	No
209[a]	22	.48(.58)	6	.56	No

[a]The item's correlation with an unintended scale exceeded the correlation with its corrected intended scale but did not exceed the correlation with its uncorrected intended scale (i.e., the scale whose score included the item in question).

[b]The first entry is the correlation between the item and its corrected intended scale; the parenthesized entry is the correlation between the item and its uncorrected intended scale.

APPENDIX H

INTERCORRELATIONS AMONG ALL 22 INTEREST SCALES BASED ON VAPP-1 DATA

Table 24

Intercorrelations Among All 22 Interest Scales Based on VAPP-1 Data (n = 100)

Scale	1 Agronomy	2 Animals	3 Assembly	4 Chemical	5 Clerical	6 Construc-tion	7 Customer
1. Agronomy	1.00						
2. Animals	.42	1.00					
3. Assembly	.47	.24	1.00				
4. Chemical	.36	.28	.57	1.00			
5. Clerical	- .01	.00	.21	.04	1.00		
6. Construction	.65	.37	.72	.46	.06	1.00	
7. Customer	.28	.11	.47	.18	.49	.38	1.00
8. Electric	.30	.03	.73	.61	- .03	.57	.20
9. Food	.43	.28	.45	.35	.49	.43	.60
10. Human	.04	- .07	- .15	- .16	.29	- .11	.22
11. Ideas	.03	.00	.01	.10	.13	.05	.21
12. Instruction	.01	.08	.18	.26	.24	- .01	.23
13. Mechanical Drawing	.30	.11	.68	.51	.00	.58	.24
14. Mechanical Maintenance	.38	.12	.81	.55	.09	.68	.30
15. Medical	.14	.36	.08	.43	.11	.05	.08
16. Navigation	.37	.16	.58	.49	- .09	.43	.17
17. Vehicles	.44	.22	.72	.47	.15	.75	.32
18. Performing Arts	- .01	.24	.01	.01	.21	.02	.16
19. Physical Coordination	.28	.25	.41	.42	.29	.44	.43
20. Supervision	.01	.01	.30	.08	.45	.11	.44
21. Numbers	.24	-.01	.47	.42	.29	.45	.43
22. Visual Arts	.32	.39	.14	.15	.19	.31	.19

Table 24 (continued)

Scale	8 Electric	9 Food	10 Human	11 Ideas	12 Instruc-tion	13 Mechanical Drawing	14 Mechanical Maintenance
8. Electric	1.00						
9. Food	.24	1.00					
10. Human	- .30	.15	1.00				
11. Ideas	.02	.08	.60	1.00			
12. Instruction	.07	.13	.43	.49	1.00		
13. Mechanical Drawing	.78	.22	- .16	.13	.12	1.00	
14. Mechanical Maintenance	.90	.32	- .20	.08	.08	.79	1.00
15. Medical	.10	.24	.16	.06	.29	- .03	.07
16. Navigation	.56	.14	- .14	.08	.15	.62	.54
17. Vehicles	.59	.32	- .18	.02	.11	.61	.66
18. Performing Arts	- .10	.17	.33	.28	.33	.00	- .07
19. Physical Coordination	.39	.48	.17	.42	.35	.38	.43
20. Supervision	.15	.37	.35	.41	.49	.20	.24
21. Numbers	.50	.40	.05	.24	.24	.57	.50
22. Visual Arts	- .03	.34	.39	.32	.19	.13	.06

Table 24 (continued)

Scale	15 Medical	16 Naviga-tion	17 Vehicles	18 Performing Arts	19 Physical Coordination	20 Super-vision	21 Num-bers	22 Visual Arts
15. Medical	1.00							
16. Navigation	.10	1.00						
17. Vehicles	.02	.53	1.00					
18. Performing Arts	.18	- .04	- .09	1.00				
19. Physical Coordination	.17	.24	.42	.20	1.00			
20. Supervision	- .05	.01	.19	.17	.45	1.00		
21. Numbers	- .06	.32	.40	- .08	.46	.43	1.00	
22. Visual Arts	.12	.04	.02	.50	.18	.13	.11	1.00

APPENDIX I

PEARSON CORRELATIONS AMONG VAPP-1 AND OVIS SCALES

Table 25

Pearson Correlations Among VAPP-1 and OVIS Scales (n = 100)

VAPP Number and Title	OVIS Scale Number and Title							
	1 Manual	2 Machine	3 Personal Service	4 Care	5 Clerical	6 Inspection	7 Crafts	8 Customer Service
1. Agronomy	.49	.36	.30	.28	.09	.41	.38	.16
2. Animal Care	.25	.19	.30	.50	.04	.32	.21	.18
3. Assembly	.50	.69	.47	.10	.22	.61	.71	.34
4. Chemical	.29	.52	.23	.19	.02	.31	.53	.02
5. Clerical	.29	.16	.48	.20	.79	.36	.01	.60
6. Construction	.63	.64	.47	.21	.12	.49	.69	.31
7. Customer	.38	.25	.57	.21	.48	.37	.26	.64
8. Electrical	.36	.69	.28	-.02	.00	.34	.72	.07
9. Food	.45	.34	.59	.36	.41	.46	.30	.53
10. Human	.07	-.28	.14	.18	.23	-.15	-.27	.27
11. Ideational	-.01	-.12	.03	.00	.06	-.16	-.06	.14
12. Instruction	-.02	-.02	.10	.19	.20	-.04	-.04	.20
13. Mechanical Drawing	.32	.65	.29	-.04	.05	.38	.68	.17
14. Mechanical Maintenance	.47	.74	.41	.03	.11	.49	.77	.23
15. Medical	.06	.01	.12	.46	.01	.05	.02	.03
16. Navigation	.23	.44	.15	-.08	-.08	.25	.47	.05
17. Vehicles	.48	.68	.37	.04	.17	.45	.63	.22
18. Performing Arts	-.13	-.20	.03	.22	.07	-.12	-.17	.18
19. Physical Coordination	.31	.33	.35	.14	.18	.14	.28	.24
20. Supervision	.09	.14	.25	.03	.40	.19	.05	.37
21. Numerical	.31	.47	.37	.05	.37	.36	.41	.34
22. Visual Arts	.12	-.01	.20	.35	.11	.10	.07	.30

Table 25 (continued)

VAPP Number and Title	OVIS Scale Number and Title							
	9 Nurse	10 Skilled Service	11 Training	12 Literary	13 Numerical	14 Appraisal	15 Agriculture	16 Applied Technology
1. Agronomy	.16	.31	.41	-.01	.14	.39	.71	.27
2. Animal Care	.30	.39	.49	.12	-.14	.14	.51	.09
3. Assembly	.13	.27	.49	-.08	.37	.62	.42	.53
4. Chemical	.31	.24	.39	.03	.38	.70	.52	.55
5. Clerical	.30	.35	.17	.21	.20	-.09	-.15	-.21
6. Construction	.08	.22	.49	-.05	.28	.49	.51	.49
7. Customer	.23	.39	.37	.15	.33	.17	.11	.07
8. Electrical	.04	.07	.27	-.15	.52	.67	.35	.69
9. Food	.37	.64	.32	.17	.23	.24	.37	.09
10. Human	.20	.08	.05	.42	-.07	-.25	-.23	-.24
11. Ideational	-.04	-.03	.18	.35	.14	.01	-.16	.09
12. Instruction	.20	.12	.25	.37	.12	.09	-.11	.03
13. Mechanical Drawing	-.10	.03	.35	-.06	.55	.65	.32	.75
14. Mechanical Maintenance	.06	.16	.36	-.10	.51	.67	.39	.64
15. Medical	.71	.24	.20	.33	-.06	.11	.24	.02
16. Navigation	-.05	.05	.46	.01	.34	.61	.36	.60
17. Vehicles	.02	.14	.41	-.17	.31	.51	.40	.51
18. Performing Arts	.10	.17	.21	.61	-.16	-.17	-.09	-.12
19. Physical Coordination	.13	.24	.40	.18	.36	.27	.23	.24
20. Supervision	.03	.18	.23	.15	.32	.11	-.11	.00
21. Numerical	.02	.17	.22	-.08	.77	.47	.20	.41
22. Visual Arts	.15	.34	.38	.45	-.06	.03	.12	.05

Table 25 (continued)

VAPP Number and Title	OVIS Scale Number and Title							
	17 Promotion	18 Supervision	19 Artistic	20 Sales	21 Music	22 Performing Arts	23 Teaching	24 Medicine
1. Agronomy	-.02	.13	.16	.29	-.07	-.06	.07	.19
2. Animal Care	.10	-.10	.34	.17	.23	.25	-.04	.35
3. Assembly	.00	.40	.02	.53	.04	-.08	.03	.21
4. Chemical	.00	.16	.09	.38	.03	.10	.01	.48
5. Clerical	.20	.37	.06	.21	.18	.07	.36	.02
6. Construction	.05	.25	.16	.48	-.01	-.01	.04	.12
7. Customer	.27	.47	.15	.62	.14	.06	.28	.09
8. Electrical	-.05	.31	-.12	.43	-.05	-.08	-.13	.20
9. Food	.23	.36	.19	.43	.14	.17	.24	.25
10. Human	.44	.15	.28	-.09	.24	.31	.51	.05
11. Ideational	.35	.30	.23	.04	.24	.32	.43	-.04
12. Instruction	.43	.41	.17	.07	.24	.31	.64	.20
13. Mechanical Drawing	.02	.39	.07	.48	.05	.00	-.06	.07
14. Mechanical Maintenance	.02	.42	-.06	.50	.01	-.08	-.02	.20
15. Medical	.19	-.08	.07	.08	.18	.19	.21	.79
16. Navigation	.03	.22	.02	.33	.07	.00	-.09	.11
17. Vehicles	-.12	.27	-.08	.39	-.08	-.10	-.07	.12
18. Performing Arts	.49	.15	.47	-.01	.68	.79	.34	.02
19. Physical Coordination	.27	.39	.14	.27	.15	.25	.28	.14
20. Supervision	.38	.72	.06	.30	.13	.17	.37	-.05
21. Numerical	.16	.49	.01	.46	-.06	-.06	.21	-.01
22. Visual Arts	.41	.13	.76	.14	.41	.46	.41	.04

APPENDIX J

INSTRUCTIONS AND RESPONSE FORMAT FOR THE VAPP-2

VOCATIONAL ACTIVITY PREFERENCE PROFILE - A

(1) Turn the answer sheet so that the yellow strip is at the top. Print your name (last name first, then first name and middle initial) in the spaces provided in the name grid at the upper right. Then darken the boxes which correspond to the letters in your name. Be sure to make heavy dark marks with your pencil. If you make a mistake, erase your first mark completely and then mark the correct letter.

(2) In the space marked "FORM OF THIS SHEET IS," darken box "A."

(3) In the space marked "1 2 3 4 5 6" just under the space for form of test, print in spaces 1, 2, and 3 the school I.D. number on the board. Then print in spaces 4, 5, and 6 the I.D. number on the upper right corner of the yellow test booklet. Now darken the boxes corresponding to these numbers.

(4) In the space marked "GRADE," darken the box corresponding to your grade in school.

(5) In the space marked, "SEX," print a "B" if you are a boy or "G" if you are a girl. Then darken the corresponding box.

(6) Turn the answer sheet so that the yellow strip is on the left. Mark your responses to item numbers 1A through 105A on this sheet.

Each item of the PROFILE describes a work activity that occurs in the performance of various jobs. Indicate how you feel about performing each activity <u>as part of a full-time job</u>. Throughout the PROFILE, <u>assume you have the needed training or education</u>.

Indicate how you feel about performing each activity by making the following marks on your answer sheet:

Fill in box "A" if you feel that you would <u>LIKE</u> to perform the activity.

Fill in box "B" if you have <u>NO OPINION</u> about the activity; that is, if you do not care one way or the other, or if you cannot decide.

Fill in box "C" if you feel that you would <u>NOT LIKE</u> to perform the activity.

Boxes labeled "<u>D</u>" and "<u>E</u>" will not be used. <u>DO NOT MARK IN THESE BOXES</u>.

(7) Make a mark on your answer sheet for each of the 105 items on Profile A. Make a heavy, dark mark with a #2 pencil. If you make a mistake or change your mind, erase your first mark completely and then mark your new choice. Work quickly; your first choice is usually best.

(8) When you have recorded your name and other information on your answer sheet, you may open the PROFILE and begin work.

APPENDIX K

RESPONSE DISTRIBUTIONS AND MEAN RESPONSE VALUES FOR THE 210 VAPP-2 ITEMS

Table 26

Response Distributions and Mean Response Values for the 210 VAPP-2 Items

Item Number	Response Position			
	Percent Like	Percent No Opinion	Percent Not Like	Mean Response[a]
1A	14.0	22.5	63.5	1.50
2A	38.5	27.5	33.5	2.03
3A	31.0	29.0	40.0	1.91
4A	20.5	24.5	55.0	1.65
5A	26.5	21.5	52.0	1.74
6A	36.0	26.5	37.5	1.98
7A	61.5	28.5	10.0	2.51
8A	34.0	27.5	38.5	1.95
9A	22.5	24.5	53.0	1.69
10A	50.0	27.0	22.5	2.25
11A	51.5	31.5	16.5	2.33
12A	53.5	27.0	20.0	2.35
13A	36.5	27.0	36.0	1.98
14A	33.5	23.5	43.0	1.90
15A	43.5	27.5	28.5	2.13
16A	23.5	32.5	43.5	1.78
17A	73.5	18.0	8.5	2.65
18A	49.0	20.0	31.5	2.19
19A	57.0	28.0	15.0	2.42
20A	50.0	23.5	26.5	2.23
21A	53.5	31.5	14.5	2.37
22A	23.0	30.0	47.0	1.76
23A	37.0	26.5	36.0	1.99
24A	27.5	29.0	43.5	1.84
25A	19.0	28.0	53.0	1.66
26A	38.0	24.0	37.5	1.98
27A	51.5	31.5	16.5	2.33
28A	45.0	29.5	25.5	2.19
29A	26.5	23.5	50.0	1.76
30A	20.0	27.0	53.0	1.67
31A	66.0	22.5	11.5	2.54
32A	44.5	40.5	15.0	2.29
33A	65.0	25.5	9.5	2.55
34A	12.5	22.5	65.0	1.47
35A	30.0	22.5	47.5	1.82
36A	41.0	26.5	32.5	2.08
37A	51.5	33.0	16.0	2.37
38A	52.5	31.0	16.5	2.36
39A	41.5	24.0	34.5	2.07
40A	35.0	36.0	29.0	2.06

Table 26 (continued)

Item Number	Response Position: Percent Like	Percent No Opinion	Percent Not Like	Mean Response[a]
41A	21.5	33.5	45.0	1.76
42A	46.0	22.5	31.0	2.13
43A	28.0	32.0	39.5	1.86
44A	38.0	26.0	36.0	2.02
45A	28.5	22.0	50.0	1.80
46A	27.5	22.5	50.0	1.77
47A	32.5	22.5	44.5	1.86
48A	20.0	24.0	56.0	1.64
49A	49.5	32.0	18.5	2.31
50A	25.5	20.5	53.5	1.70
51A	44.0	23.0	33.0	2.11
52A	42.0	32.0	26.0	2.16
53A	45.0	36.0	19.0	2.26
54A	35.0	33.0	32.0	2.03
55A	27.5	22.0	50.5	1.77
56A	26.0	20.0	54.0	1.72
57A	45.0	22.5	32.0	2.11
58A	23.0	27.0	50.0	1.73
59A	25.5	20.5	54.0	1.71
60A	21.5	21.5	57.0	1.64
61A	34.5	34.5	31.0	2.03
62A	30.0	22.0	48.0	1.82
63A	35.0	32.5	32.5	2.02
64A	30.5	25.0	44.0	1.84
65A	52.5	21.0	26.0	2.24
66A	33.5	27.5	39.0	1.94
67A	20.0	22.0	58.0	1.62
68A	18.0	29.0	53.0	1.65
69A	24.0	23.5	52.5	1.71
70A	37.5	32.5	29.5	2.06
71A	16.5	21.0	62.5	1.54
72A	24.0	30.0	46.0	1.78
73A	36.0	37.0	26.5	2.07
74A	45.5	29.0	25.5	2.20
75A	40.0	28.5	31.5	2.08
76A	42.5	23.5	34.0	2.08
77A	22.5	26.5	50.5	1.70
78A	31.5	17.5	51.0	1.80
79A	26.0	26.5	47.5	1.78
80A	22.5	21.5	56.0	1.66
81A	28.5	17.5	54.0	1.74
82A	61.5	26.0	12.0	2.47

Table 26 (continued)

Item Number	Response Position: Percent Like	Percent No Opinion	Percent Not Like	Mean Response[a]
83A	19.0	25.0	56.0	1.65
84A	47.0	20.0	32.5	2.12
85A	16.5	29.5	53.5	1.61
86A	45.0	22.5	32.5	2.12
87A	22.5	29.5	48.0	1.74
88A	24.0	21.0	55.0	1.69
89A	35.5	29.5	35.0	2.00
90A	13.0	21.5	65.5	1.47
91A	45.0	28.5	26.5	2.18
92A	24.0	22.0	53.5	1.68
93A	24.5	20.0	56.0	1.70
94A	38.5	28.5	33.5	2.07
95A	47.5	28.5	24.0	2.23
96A	43.5	30.0	26.5	2.17
97A	24.0	26.0	49.5	1.72
98A	25.0	24.0	51.0	1.74
99A	43.5	25.5	31.0	2.12
100A	54.0	24.0	22.0	2.32
101A	60.0	22.0	17.5	2.40
102A	24.0	21.5	54.0	1.68
103A	59.0	27.0	14.0	2.45
104A	25.0	38.0	37.0	1.88
105A	57.0	19.5	23.0	2.34
1B	28.5	31.5	40.0	1.88
2B	35.5	23.0	42.0	1.95
3B	22.0	29.0	49.0	1.73
4B	17.5	17.5	65.5	1.54
5B	23.0	30.5	46.5	1.76
6B	17.0	28.0	55.0	1.62
7B	14.0	30.5	55.0	1.57
8B	24.5	22.5	52.5	1.70
9B	22.5	23.5	54.0	1.68
10B	46.5	28.5	25.0	2.21
11B	43.5	33.5	23.0	2.20
12B	40.0	31.0	29.0	2.11
13B	25.0	23.5	51.5	1.73
14B	25.5	25.5	49.5	1.78
15B	37.5	27.5	35.0	2.02
16B	30.0	23.0	47.0	1.83
17B	36.5	30.5	33.0	2.03
18B	18.0	17.0	65.0	1.53
19B	54.0	31.5	14.0	2.38

Table 26 (continued)

Item Number	Response Position: Percent Like	Percent No Opinion	Percent Not Like	Mean Response[a]
20B	47.5	22.0	30.0	2.15
21B	55.5	22.0	22.5	2.33
22B	20.0	23.0	57.0	1.63
23B	30.5	22.0	47.5	1.83
24B	30.5	24.0	45.5	1.85
25B	20.0	27.0	53.0	1.67
26B	27.5	22.0	50.0	1.75
27B	39.0	29.0	31.5	2.08
28B	43.0	27.5	29.0	2.12
29B	23.5	19.5	57.0	1.66
30B	12.0	24.0	64.0	1.48
31B	42.5	29.0	29.0	2.15
32B	47.0	33.5	19.5	2.27
33B	23.0	25.0	52.0	1.71
34B	25.0	24.5	50.5	1.74
35B	32.0	24.5	43.5	1.88
36B	53.5	23.0	23.5	2.30
37B	26.5	29.0	44.5	1.82
38B	38.5	27.0	34.0	2.05
39B	20.5	20.0	59.0	1.61
40B	43.0	33.5	23.0	2.20
41B	19.0	23.0	57.5	1.59
42B	44.5	22.0	33.0	2.09
43B	20.0	24.0	56.0	1.64
44B	43.0	23.0	34.0	2.09
45B	21.0	28.5	50.0	1.69
46B	22.5	30.0	47.5	1.75
47B	33.0	29.0	38.0	1.95
48B	36.5	30.0	33.5	2.03
49B	28.5	32.5	39.0	1.89
50B	22.0	20.0	57.5	1.62
51B	16.0	26.5	57.5	1.58
52B	49.0	27.0	24.0	2.25
53B	42.5	30.5	27.0	2.15
54B	54.0	27.0	19.5	2.36
55B	25.5	23.5	51.0	1.74
56B	29.0	20.0	51.0	1.78
57B	37.0	27.5	35.0	2.00
58B	46.0	28.0	25.5	2.18
59B	31.5	24.5	44.0	1.87
60B	34.5	24.5	41.0	1.93
61B	28.0	26.5	45.5	1.82

Table 26 (continued)

Item Number	Response Position: Percent Like	Percent No Opinion	Percent Not Like	Mean Response[a]
62B	28.0	18.5	53.5	1.74
63B	35.0	32.5	32.5	2.02
64B	20.0	27.5	52.5	1.67
65B	37.5	26.0	36.5	2.01
66B	20.5	27.5	52.0	1.68
67B	24.0	19.5	56.5	1.67
68B	34.0	21.5	44.5	1.89
69B	24.0	21.5	54.5	1.69
70B	46.5	30.5	23.5	2.25
71B	24.5	21.5	54.5	1.72
72B	36.5	26.5	37.0	1.99
73B	44.5	25.5	30.5	2.16
74B	41.0	28.0	31.0	2.10
75B	28.5	30.0	41.5	1.87
76B	21.0	25.0	54.5	1.68
77B	22.5	22.0	55.5	1.67
78B	25.5	26.5	48.0	1.77
79B	23.0	32.5	44.0	1.79
80B	26.5	19.0	54.5	1.72
81B	14.5	16.5	69.0	1.45
82B	26.5	30.5	42.5	1.82
83B	35.5	31.5	33.0	2.02
84B	58.0	17.5	24.5	2.33
85B	24.5	30.0	45.5	1.79
86B	41.0	25.5	33.5	2.07
87B	19.5	26.0	54.5	1.65
88B	20.5	22.5	57.0	1.63
89B	23.5	24.0	52.0	1.69
90B	15.0	26.0	59.0	1.56
91B	40.5	31.5	28.0	2.15
92B	19.5	26.5	54.0	1.65
93B	32.5	25.5	41.5	1.91
94B	52.5	25.0	22.0	2.31
95B	50.0	30.5	19.5	2.30
96B	45.0	31.5	23.0	2.30
97B	25.0	24.5	50.5	1.74
98B	26.5	20.0	52.5	1.72
99B	44.5	25.5	30.0	2.40
100B	27.5	28.0	44.0	1.81
101B	35.5	21.0	43.0	1.92
102B	33.5	24.5	41.5	1.92

Table 26 (continued)

Item Number	Response Position			
	Percent Like	Percent No Opinion	Percent Not Like	Mean Response[a]
103B	25.5	35.5	39.0	1.86
104B	23.0	31.5	45.5	1.77
105B	44.0	23.0	31.5	2.11

[a]A "LIKE" response was assigned a value of "3," a "No Opinion" response a value of "2," and a "NOT LIKE" response a value of "1."

APPENDIX L

FREQUENCY DISTRIBUTIONS OF VAPP-2 SCALE SCORES

Table 27

Frequency Distributions of VAPP-2 Scale Scores (n = 506)

Scale	Scale Score Interval						
	10-12	13-15	16-18	19-21	22-24	25-27	28-30
	Frequency						
1. Agronomy	134	90	97	65	58	32	30
2. Animals	94	52	60	65	64	68	103
3. Assembly	124	90	76	73	63	39	41
4. Chemical	178	92	62	66	29	40	39
5. Clerical	120	86	63	80	48	44	65
6. Construction	88	109	86	83	65	38	37
7. Customer	36	58	67	83	88	100	74
8. Electric	200	68	51	45	36	34	72
9. Food	22	89	97	68	59	41	30
10. Human	42	48	66	79	52	77	143
11. Ideas	14	48	73	89	61	73	128
12. Instruction	29	65	66	85	91	90	80
13. Mechanical Drawing	156	73	59	67	59	41	51
14. Mechanical Maintenance	187	55	52	63	37	28	84
15. Medical	91	49	65	70	50	67	114
16. Environmental Communications	66	67	103	80	81	59	50
17. Vehicles	51	70	94	74	67	67	83
18. Performing Arts	139	79	70	77	58	42	41
19. Supervision	20	30	84	116	99	87	157
20. Numbers	79	89	83	98	81	41	35
21. Visual Arts	35	50	59	136	86	99	100

APPENDIX M

CORRELATIONS BETWEEN VAPP-2 ITEMS AND THEIR CORRECTED INTENDED SCALES

Table 28

Correlations Between VAPP-2 Items and Their Corrected Intended Scales

Scale 1		Scale 2		Scale 3		Scale 4		Scale 5		Scale 6		Scale 7	
Item #	r	Item #	r	Item #	r	Item #	r	Item #	r	Item #	r	Item #	r
1A	.51	23A	.64	3A	.51	88A	.58	68A	.54	27A	.35	49B	.45
22A	.53	2A	.67	3B	.58	4A	.60	89A	.56	6A	.46	7B	.46
85B	.53	86A	.69	66A	.60	46B	.61	5B	.63	48B	.56	7A	.48
1B	.61	44A	.70	24A	.60	25A	.63	5A	.65	27B	.58	28A	.57
22B	.63	65A	.71	66B	.63	25B	.71	26A	.69	90A	.64	91B	.62
64B	.66	23B	.71	45B	.66	46A	.73	47B	.70	69B	.65	70B	.67
64A	.69	86B	.75	87B	.67	4B	.76	89B	.71	90B	.66	28B	.70
85A	.71	2B	.76	45A	.69	88B	.77	47A	.75	6B	.68	70A	.71
43A	.72	65B	.79	87A	.69	67A	.77	26B	.76	48A	.70	91A	.72
43B	.74	44B	.81	24B	.74	67B	.79	68B	.79	69A	.70	49A	.75

Table 28 (continued)

Scale 8		Scale 9		Scale 10		Scale 11		Scale 12		Scale 13		Scale 14	
Item #	r	Item #	r	Item #	r	Item #	r	Item #	r	Item #	r	Item #	r
92B	.69	30B	.46	10A	.57	11A	.43	33B	.46	76A	.53	14A	.75
71A	.69	93B	.57	73A	.60	32A	.54	33A	.46	34A	.58	98B	.78
8A	.74	51A	.59	31A	.62	32B	.58	75A	.51	13A	.65	35B	.78
29A	.82	93A	.59	52B	.70	53A	.59	54A	.53	34B	.66	56A	.80
92A	.83	30A	.60	31B	.71	74A	.60	96A	.61	76B	.71	98A	.81
50A	.84	72A	.63	52A	.72	74B	.62	12B	.62	97B	.72	77A	.81
71B	.84	9A	.64	94A	.72	95A	.62	12A	.62	55A	.77	35A	.84
29B	.85	51B	.66	94B	.76	11B	.64	75B	.63	55B	.79	56B	.84
50B	.86	72B	.69	73B	.78	95B	.65	54B	.70	97A	.79	77B	.84
8B	.86	9B	.74	10B	.78	53B	.67	96B	.71	13B	.82	14B	.84

Table 28 (continued)

Scale 15		Scale 16		Scale 17		Scale 18		Scale 19		Scale 20		Scale 21	
Item #	r	Item #	r	Item #	r	Item #	r	Item #	r	Item #	r	Item #	r
78B	.65	100A	.44	17A	.40	18A	.59	82A	.40	83B	.37	42A	.39
15A	.66	58A	.46	80A	.56	81B	.60	103B	.41	104B	.47	63B	.45
78A	.67	37A	.53	101A	.60	18B	.60	19A	.46	41A	.48	63A	.53
15B	.68	58B	.57	17B	.62	102B	.64	103A	.46	104A	.53	21A	.54
36A	.73	100B	.61	38A	.63	39B	.64	82B	.47	20A	.58	42B	.57
36B	.74	16A	.62	59A	.66	60B	.66	19B	.48	62A	.60	105B	.63
99B	.78	79A	.65	38B	.71	39A	.66	40A	.53	41B	.62	21B	.64
57B	.78	16B	.68	59B	.73	60A	.66	61A	.60	83A	.62	84A	.66
99A	.80	79B	.68	80B	.73	102A	.70	61B	.62	20B	.64	105A	.69
57A	.80	37B	.72	101B	.76	81A	.74	40B	.63	62B	.65	84B	.70

APPENDIX N

ITEM-SCALE CORRELATIONS FOR THE 12 VAPP-2 ITEMS WHOSE CORRELATIONS WITH UNINTENDED SCALES EXCEEDED THE CORRELATIONS WITH THEIR CORRECTED INTENDED SCALES

Table 29

Item-Scale Correlations for the 12 VAPP-2 Items Whose Correlations with Unintended Scales Exceeded the Correlations with Their Corrected Intended Scales

Scale #	Item #	Corrected Item-Parent Scale r	Scales with Which More Highly Correlated					
			Scale #	r	Scale #	r	Scale #	r
3	45A	.69	8	.73	14	.78		
6	27A	.35	3	.40	13	.39		
8	92B	.69	14	.70				
10	73A	.60	11	.61				
13	76B	.71	14	.73				
13	97B	.72	14	.73				
16	58A	.46	17	.47				
16	100A	.44	17	.47				
19	82A	.40	10	.52	11	.44	12	.49
19	103A	.46	10	.49	12	.50		
19	103B	.41	5	.44	7	.44	20	.45
20	83B	.37	11	.43	18	.40		

APPENDIX O

INTERCORRELATIONS AMONG ALL 21 INTEREST SCALES BASED ON VAPP-2 DATA

Table 30

Intercorrelations Among All 21 Interest Scales Based on VAPP-2 Data (n = 506)

Scale	1 Agronomy	2 Animals	3 Assembly	4 Chemical	5 Clerical	6 Construc-tion	7 Customer
1. Agronomy	1.00	.45	.41	.31	.17	.55	.23
2. Animals		1.00	.12	.10	.33	.23	.29
3. Assembly			1.00	.32	- .02	.72	.22
4. Chemical				1.00	.11	.22	.08
5. Clerical					1.00	- .02	.47
6. Construction						1.00	.22
7. Customer							1.00

Scale	8 Electric	9 Food	10 Human	11 Ideas	12 Instruc-tion	13 Mechanical Drawing	14 Mechanical Maintenance
1. Agronomy	.32	.38	.13	.23	.26	.33	.35
2. Animals	- .06	.43	.32	.20	.32	- .03	- .05
3. Assembly	.78	.21	- .07	.22	.16	.75	.82
4. Chemical	.39	.18	.20	.38	.30	.40	.30
5. Clerical	- .17	.55	.34	.22	.41	- .17	- .19
6. Construction	.60	.28	- .11	.13	.10	.60	.66
7. Customer	.06	.51	.35	.31	.49	.07	.08
8. Electric	1.00	- .01	- .13	.19	.02	.79	.88
9. Food		1.00	.31	.28	.43	.02	.02
10. Human			1.00	.72	.71	- .11	- .23
11. Ideas				1.00	.65	.25	.11
12. Instruction					1.00	.10	- .03
13. Mechanical Drawing						1.00	.80
14. Mechanical Maintenance							1.00

Table 30 (continued)

Scale	15 Medical	16 Environmental Communications	17 Vehicles	18 Performing Arts	19 Supervision	20 Numbers	21 Visual Arts
1. Agronomy	.30	.44	.39	.22	.19	.26	.31
2. Animals	.45	.19	.15	.29	.16	.16	.49
3. Assembly	.00	.65	.69	- .03	.32	.36	.05
4. Chemical	.40	.34	.20	.21	.22	.44	.17
5. Clerical	.28	.09	.04	.39	.37	.42	.47
6. Construction	- .01	.62	.72	.03	.19	.26	.16
7. Customer	.24	.29	.28	.33	.59	.36	.36
8. Electric	- .02	.57	.56	- .11	.19	.28	- .09
9. Food	.30	.27	.28	.45	.33	.32	.52
10. Human	.45	.09	- .07	.47	.48	.22	.47
11. Ideas	.35	.26	.14	.37	.53	.42	.41
12. Instruction	.44	.27	.09	.54	.56	.39	.52
13. Mechanical Drawing	- .03	.55	.49	- .06	.22	.35	.06
14. Mechanical Maintenance	- .05	.56	.64	- .14	.18	.25	- .13
15. Medical	1.00	.18	.03	.33	.25	.23	.30
16. Environmental Communications		1.00	.69	.12	.30	.32	.14
17. Vehicles			1.00	.04	.26	.28	.08
18. Performing Arts				1.00	.29	.20	.54
19. Supervision					1.00	.46	.26
20. Numbers						1.00	.24
21. Visual Arts							1.00

APPENDIX P

THE SCALE DESCRIPTION BOOKLET AND STUDENT REPORT FORM USED IN REPORTING INDIVIDUAL RESULTS TO PARTICIPANTS IN THE STUDY

HOW TO INTERPRET YOUR INVENTORY RESULTS

On your computer profile sheet, you will find a list of 21 vocational activity areas along the left side of the page. Beside each of these areas, your score for that scale is presented. These scores are percentages which give you some idea of how you feel about the activities in each scale.

A score of 0% on a scale means that you dislike every activity in that area.

A score of 25% on a scale means that you dislike more activities than you like in that scale.

A score of 50% on a scale means that you are neutral towards the activities on that scale, or that you did not have enough information about the activities to make judgments.

A score of 75% on a scale means that you like more activities than you dislike in that scale.

A score of 100% on a scale means that you like every activity on that scale.

Look at your five highest scale scores. These vocational activity areas should agree with your job interests. These scores tell you which of the vocational activity areas you prefer; they DO NOT tell you what your abilities are. You will do best at a job which you enjoy and one for which you have sufficient ability, but your abilities are not measured by this inventory. They can be judged by an achievement test or your school grades.

The 21 vocational activity areas listed on your profile are printed on the following pages in alphabetical order, along with a brief description and some typical jobs in each area. Read the descriptions for your five highest scale scores. This should give you an idea of the type of work activities you would most enjoy doing. The jobs listed at the end of each description are just a few examples of the many jobs in each area.

Scale #1
Agronomy

If you scored high on Agronomy, you are interested in farming that involves all kinds of plant life. You show an interest in using tractors and other farm machinery such as plows, discs, mowers, balers, combines, and pickers. Hand tools like clippers, rakes, and hoes could also be used. Persons interested in Agronomy like a variety of activities such as sowing seeds, pruning trees, preparing irrigation ditches, and picking fruit and vegetables. Preparing soil for transplanting trees, plants, and shrubs interests persons with high Agronomy scores. You probably enjoy finding out how the weather affects plant farming and are interested in using charts and maps to learn about soil properties and plant life. Examples of jobs include: Farm Foreman; Vegetable Grower; Apple Farmer; Orchard Foreman; and Cranberry Grower. These are just a few of the jobs persons with a high Agronomy score would like.

Scale #2
Animal Care and Training

If you scored high on this scale, you probably like to work with and be around animals. You might enjoy grooming animals, for example, brushing their fur, trimming their nails, or bathing them. Or you might prefer to train animals to do tricks, to work, or to be obedient to special commands. Feeding and exercising animals and making sure they are well cared for are other activities belonging to this scale. Another type of job in this area involves judging the way animals look or perform in a show or auction.

These are a few of the jobs which involve Animal Care and Training: Pony Ride Manager; Head Animal Keeper (for example, at a zoo); Livestock Farm Hand; Groomer; Pet Salesperson; and Dairy Farm Hand.

Scale #3
Assembly

If you scored high on Assembly, you probably enjoy putting things together by following instructions. You like to use hand tools, such as screwdrivers and staplers, or machines which fasten together pieces of an object.

In these types of jobs, you might use screws, wire, staples, glue, or bolts to join parts of objects together. You might also put together plastic or rubber objects. People who have assembly jobs pay a lot of attention to how well the pieces fit together, how well the object works after it has been put together and how good it looks. They generally do their work in factories. They may also test assembled objects for safety and proper functioning.

These are a few of the jobs which involve Assembly: Small Products Assembler (for example, clocks); Electric Motor Assembler; Microwave Tube Assembler; Seamstress; Gluer; and Venetian Blind Assembler.

Scale #4
Chemical Activities

If you scored high on Chemical Activities, it indicates that you enjoy working with symbol systems like those used for chemical elements. High scorers on Chemical Activities enjoy using instruments and machines to measure the properties of chemicals. Learning which chemicals react with each other and why they do interests those who score high on this scale; you should also enjoy measuring, counting, and inspecting different things about matter. Mixing together and separating chemicals are typical activities in this kind of work. Tasks such as carefully weighing substances or measuring liquids and solvents are activities associated with Chemical Activities. Examples of jobs in this interest area include: Industrial Waste Inspector; Assistant Library Technician; Chief Pharmacist; Laboratory Technician; Pilot-Plant Control Operator (Chemistry, plastic material); Biological Tester; Organic Chemist; and Analytical Chemist. All kinds of chemists would score high on this scale, as well as laboratory technicians who like to work with chemicals.

Scale #5
Clerical Activities

If you scored high on this scale, you like doing the types of things office workers do all the time. You might like to sort things (such as letters or written pages), to file written materials, or to put things in alphabetical order. Or you might enjoy editing or checking things which have been written for mistakes in spelling, grammar, typing, addresses, or composition. Many people with clerical jobs operate office machines, such as typewriters, telephone switchboards, dictating machines, photocopiers, printing machines, and card sorters. They also use materials such as pen and paper to take down messages or other spoken information.

These are a few of the jobs which involve Clerical Activities: Personnel Secretary; Columnist; Office Worker; Stenographer; Inventory Clerk; Correspondence Clerk; and Typist.

Scale #6
Construction

If you scored high on the Construction scale, you are interested in helping build houses, buildings, and other large structures. You probably like manual labor, such as nailing house framing together or smoothing fresh concrete. Persons interested in Construction might enjoy installing things like carpeting, plumbing, cabinets, or windows. Laying bricks and stone or plastering walls are typical activities in this interest area. Some persons who score high on this scale would rather inspect buildings to see that they are constructed properly. Examples of Construction jobs include: Shipfitter; Carpenter Helper; Construction Foreman; Bricklayer; Bench Carpenter; and Painter.

Scale #7
Customer Sales and Service

If you scored high on this scale, you like to sell people things or to perform services for them. You might be interested in ways of attracting new customers and of keeping customers which you already have. Another concern might be the use of successful advertising material and marketing techniques. You would probably handle cash, checks, money orders, or credit cards. You might sell objects, such as tractors or clothes, or you might do things for people, such as deliver items or make hotel guests comfortable.

These are a few jobs which involve Customer Sales and Service: Wig Fitter; Department Store Salesperson; Hotel Clerk; Usher; Insurance Salesperson; and Steward/Stewardess.

Scale #8
Electrical and Electronic Assembly and Maintenance

If you scored high on this scale, you are interested in putting together or working on electrical or electronic devices. Electronic devices include radios, televisions, telephones, hi-fi equipment, and other things that contain tubes or transistors. Electrical devices include all other equipment that uses electricity, such as electric motors and electric wiring in buildings and machines. You are probably interested in assembling, inspecting, repairing, or adjusting some or all of these devices. This kind of work involves using electrical information and electrical and electronic test equipment. Examples of Electrical and Electronic jobs include: Electric Aircraft Mechanic; Technical Instructor; Radio Mechanic; Electrical Assembler; Electrician Helper; Senior Communications Electrician; Factory or Mill Maintenance Man; Bio-Instrumentation Technician.

Scale #9
Food Preparation

People who score high on this scale like to work with food. They might cook, such as in a restaurant or for private parties; or they might buy food to be prepared and sold in different types of eating places. They might clean the cooking utensils and kitchen areas or operate large machinery such as ovens, cold storage rooms, or dishwashers. The flavor and odor of food are important to most people working at these types of jobs; dietary information may be important as well.

These are a few of the jobs which involve Food Preparation: Dietary Aide; Cook's Helper; Short-Order Cook; School Lunch Supervisor; Chef; and Kitchen Supervisor.

Scale #10
Human Assessment and Interpersonal Relations

People who score high on this scale like to work with all kinds of information about people. They may study or measure human behavior, moods, physical performance, opinions, or adjustment. Some common interpersonal activities in this interest area are counseling, debate, discussion, arbitration, negotiation, and giving advice. A few of the jobs in this area deal with conflicts between people and unpleasant social relationships, such as the work a marriage counselor or lawyer might do.

These are a few of the jobs which involve Human Assessment and Interpersonal Relations: Credit Manager; Principal; Case Worker; Hostess in Home for the Aged; Psychiatrist; Lawyer; and Marriage Counselor.

Scale #11
Ideational Activities

If you scored high on this scale, you probably enjoy thinking a lot and using your mind to make things work. You might like to plan things or solve problems, or you might prefer to come up with new ideas or remember facts about things that have happened. People with jobs in this area spend a lot of time figuring out the causes of problems and different ways of solving them. They also work at trying to express ideas well so that others can understand them easily.

These are a few of the jobs which involve Ideational Activities: Sociologist; Clergyman; Legislative Liaison; Corporation President; Psychologist; and City Sports Writer.

Scale #12
Instruction

People who score high on this scale like to teach or instruct other people. They may teach school subjects or skills such as swimming or speaking a foreign language. They also enjoy being around students and interacting with them. Jobs in this area also involve testing people on their improvement or knowledge in certain areas. Machinery such as slide or film projectors may be used occasionally in these jobs. Sometimes, people in these jobs have extra responsibilities in the community, such as being the director of a charity organization.

These are a few jobs which involve Instruction: College or University Faculty Member; Programming Technology Instructor; Computer Operator Instructor; Language Teacher; Social Director; and Religious Director.

Scale #13
Mechanical and Structural Drawing

If you scored high on this scale, you are interested in drafting and mechanical drawing activities. You like to make plans that involve assemblying, constructing, and installing mechanical and structural objects. Using diagrams, charts, and maps would be part of this kind of work. You probably like to prepare mechanical drawings and blueprints, as well as read and write reports about the design of new machines. Persons scoring high on Mechanical and Structural Drawing like to use things like rulers and drawing compasses to design new mechanical devices and large structures such as ships or factories. Examples of jobs involving Mechanical and Structural Drawing include: Mechanical Engineering Assistant; Electromechanical Designer; Tool Designer; Naval Architect; Thermodynamics Engineer; Waterworks Engineer; and Draftsman.

Scale #14
Mechanical Maintenance

If you scored high on this scale, you like to work on mechanical things--keep them working satisfactorily, adjust them, or repair them when they break down. Persons interested in this kind of work like to control the quality and amount of product that a machine makes. This will sometimes require the use of mechanical test equipment, such as an RPM counter or temperature and pressure gauges. Persons doing this type of work would need to learn why a machine does not work properly as well as decide what to do to make it function correctly again. Mechanical Maintenance could certainly include adjusting and tuning mechanical machines such as car motors. Examples of these jobs include: Aircraft and Engine Mechanic; Production Mechanic; Automobile Service Station Mechanic; Packaging Machine Mechanic; Electrical Appliance Serviceman; Web Press Man; and Boat Mechanic.

Scale #15
Medical and Related Activities

If you scored high on Medical and Related Activities, you are interested in the prevention, diagnosis, and treatment of disease and sickness in people or animals. Persons doing this kind of work are concerned with the symptoms, feelings, activities, and requests of patients. They would be interested in helping people or animals stay well in addition to curing the illnesses of people or animals already sick. Performing physical examinations and giving medicine could be part of a medical job. Tests and medical equipment may be used to determine the cause of health problems. Persons working in this area enjoy reading about health and nutrition and might need to read X-rays or perform surgery on patients. Examples of jobs in this area include: Obstetrical Consultant; Industrial Nurse; General Medical Doctor; Supervisor of Nursing Care; Veterinarian; Dentist; Osteopath; and Psychiatrist.

Scale #16
Environmental Communications

If you scored high on Environmental Communications, you are interested in situations which require you to communicate with persons in remote locations. Often, such communications involve emergency situations or navigational signals. The location and direction of movement of automobiles, aircraft, and ships can be part of Environmental Communications. Electronic communications equipment such as radar, telephones, and car radios can be used by persons working in this job area. Sending radio messages to a diving crew or a taxi driver would be typical activities. Some persons working in the area of Environmental Communications could send and receive coded messages, while others might observe the course of aircraft or ships. Examples of jobs include: Fishing Vessel Captain; Airline First Officer; Airplane Captain; Air-Traffic Control Specialist; and Taxi Dispatcher.

Scale #17
Operation of Vehicles and Mechanized Equipment

If you scored high on this scale, you are interested in driving vehicles and equipment such as cars, small trucks, tractor-trailer trucks, buses, and bulldozers. You like activities where you have to react fast and coordinate hand and foot movements to control moving machines and steer vehicles or equipment over a prescribed track, course, or road. Examples of jobs include: Power-Shovel Operator; Log Stacker Operator; Gasoline Truck Operator; Chauffeur; Fork-Lift Truck Operator; Bus Driver; and Tractor-Trailer Truck Driver.

Scale #18
Performing Arts

If you scored high on this scale, you probably like to do things which involve acting, dancing, singing, or playing a musical instrument for the entertainment of others. If you like to perform musically, you would know about such things as tonal quality and technique, selection of musical style, and musical notation. If you like acting or dancing, you would know about facial expression, body movements, and voice characteristics.

These are a few of the jobs which involve the Performing Arts: Actor/Actress; Executive Producer; Music Director; Ballet Dancer; Director (for example, of a play or movie); Music Teacher; and Orchestra Member.

Scale #19
Supervision and Organization of Work

If you scored high on this scale, you like to supervise and organize the work of other people. You like to find out what goals need to be achieved and then decide what work needs to be done to achieve them. This also involves deciding when the work must be finished and who will do it. Persons interested in Supervision and Organization of Work like to make plans for organizations, and they enjoy reading and writing reports and memos about organizational objectives. Rating how well workers do their jobs and encouraging workers to follow directions are typical activities in this area. Examples of supervisory jobs are: Foreman; Warehouse Manager; Corporation President; Airline Lounge Manager; Chief Telephone Operator; and Quality Control Director.

Scale #20
Utilization of Numerical Data

People who score high on this scale like to use numbers to communicate information in their job. The information may be about people, places, or things and be presented in the form of graphs, charts, or tables of numbers; it may either be spoken or written. Tasks in this area could be as simple as counting items or copying down stock numbers onto large inventory sheets, or as complicated as solving difficult mathematical equations.

These are a few jobs which involve the Utilization of Numerical Data: Bookkeeper; Checker (for example, in a grocery store); Portfolio Investment Analyst; Bank Clerk; Accountant; Treasurer; and Mathematician.

Scale #21
Visual Arts

If you scored high on this scale, you like to produce pleasing visual effects by using color combinations, different shapes and forms, and many arrangements of objects. You might enjoy using sketches or scale models of things in doing your work. Typical work assignments might be to complete art or decorative plans, designs, or objects. You might even be an artist and create things like paintings, statues, sculptures, photographs, or other works of art. Sometimes, people with jobs in this interest area judge the quality or value of artistic objects completed by others.

These are a few jobs which involve Visual Arts: Art Teacher; Layout Artist; Art Coordinator; Display Manager; Artist-Writer; Sculptor; Cloth Designer; and Interior Decorator.

VOCATIONAL ACTIVITY PREFERENCE PROFILE - PROTOTYPE EDITION

NAME: GRADE: 9 SCHOOL: 4

SCALE NUMBER	SCALE TITLE	SCALE SCORE (%)	PROFILE OF SCALE SCORES 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
1	AGRONOMY	90	**********
2	ANIMAL CARE AND TRAINING	100	**********
3	ASSEMBLY	50	**********
4	CHEMICAL ACTIVITIES	50	**********
5	CLERICAL ACTIVITIES	90	**********
6	CONSTRUCTION	80	**********
7	CUSTOMER SALES AND SERVICE	75	**********
8	ELECTRICAL AND ELECTRONIC ASSEMBLY AND MAINTENANCE	5	***
9	FOOD PREPARATION	100	**********
10	HUMAN ASSESSMENT AND INTERPERSONAL RELATIONS	55	**********
11	IDEATIONAL ACTIVITIES	60	**********
12	INSTRUCTION	75	**********
13	MECHANICAL AND STRUCTUAL DRAWING	10	******
14	MECHANICAL MAINTENANCE	15	**********
15	MEDICAL AND RELATED ACTIVITIES	95	**********
16	ENVIRONMENTAL COMMUNICATIONS	90	**********
17	OPERATION OF VEHICLES AND MECHANIZED EQUIPMENT	100	**********
18	PERFORMING ARTS	85	**********
19	SUPERVISION AND ORGAINIZATION OF WORK	60	**********
20	UTILIZATION OF NUMERICAL DATA	70	**********
21	VISUAL ARTS	90	**********

THE INFORMATION PRESENTED ABOVE IS BASED ON A TRIAL FORM OF THE VOCATIONAL ACTIVITY PREFERENCE PROFILE. SINCE THE PROFILE IS STILL IN THE DEVELOPMENTAL STAGE, THE RESULTS SHOULD BE USED ONLY AS SUGGESTED GUIDELINES ON YOUR ACTIVITY PREFERENCES, NOTHING MORE. IF POSSIBLE, YOU SHOULD DIRECT ANY QUESTIONS ABOUT THE PROFILE TO YOUR GUIDANCE COUNSELOR.

APPENDIX Q

FACTOR ANALYSIS OF THE 21 VAPP-2 SCALES

1. Principal Axes Extraction of Eigenvalues with 1.00's on the Main Diagonal

2. Repeated Principal Axes Procedure with Multiple Correlations as Communality Estimates, and Orthogonal Rotations of the Number of Factors Determined in Step 1

1. Principal Axes Extraction of Eigenvalues with 1.00's in the Main Diagonal

VARIABLE	MEAN	ST.DEV.
1	17.179351	5.672292
2	20.397064	6.739338
3	17.720947	5.631758
4	16.591415	6.[illegible]356
5	18.344260	6.279227
6	18.[illegible]463	5.415654
7	21.233017	5.[illegible]732
8	16.545679	6.874125
9	17.526550	5.[illegible]678
10	22.230972	6.127519
11	22.431351	5.355[illegible]87
12	21.397[illegible]65	5.362664
13	17.627777	6.233568
14	17.557067	7.120719
15	20.544708	6.655076
16	19.439545	5.871154
17	20.340302	5.878251
18	17.777618	6.038527
19	21.560989	4.806770
20	18.664169	5.366532
21	21.585962	5.606986

CORRELATION MATRIX

	1	2	3	4	5	6	7	8	9	10
1	1.00000									
2	0.45143	1.00000								
3	0.40639	0.11425	1.00000							
4	0.32123	0.09650	0.30039	1.00000						
5	0.10446	0.32417	-0.02192	0.10246	1.00000					
6	0.56032	0.23975	0.72314	0.22083	-0.01506	1.00000				
7	0.22348	0.27659	0.22546	0.06894	0.45715	0.22437	1.00000			
8	0.32198	-0.06458	0.77164	0.37919	-0.17654	0.59052	0.65534	1.00000		
9	0.37798	0.41380	0.21497	0.18371	0.54427	0.30648	0.50022	-0.00976	1.00000	
10	0.12312	0.30793	-0.07489	0.23056	0.33650	-0.10187	0.33608	-0.13990	0.29221	1.00000
11	0.22610	0.19104	0.25805	0.37473	0.21723	0.12823	0.29763	0.17616	0.27485	0.71735
12	0.25318	0.31247	0.14489	0.28589	0.40318	0.09139	0.48617	-0.00059	0.43215	0.71198
13	0.33478	-0.03934	0.74467	0.38679	-0.16577	0.59589	0.66427	0.78725	0.02648	-0.11841
14	0.35586	-0.04932	0.82062	0.28776	-0.18444	0.66059	0.08992	0.87972	0.02940	-0.23310
15	0.29095	0.44300	-0.01135	0.39422	0.28767	-0.00549	0.23085	-0.03728	0.29462	0.44815
16	0.44730	0.19217	0.64582	0.32938	0.09523	0.62856	0.29116	0.56023	0.27936	0.08051
17	0.38566	0.14709	0.69455	0.19044	0.04487	0.72117	0.28639	0.55944	0.28489	-0.07724
18	0.22887	0.28625	-0.03292	0.21184	0.39014	0.04012	0.32079	-0.11649	0.45082	0.46790
19	0.17942	0.14977	0.30819	0.20095	0.36438	0.18268	0.59115	0.17346	0.31945	0.47362
20	0.25840	0.15184	0.36221	0.43635	0.40808	0.27286	0.34514	0.28399	0.32089	0.21745
21	0.31419	0.48202	0.04338	0.16200	0.46603	0.15805	0.34511	-0.10233	0.51466	0.45839

	11	12	13	14	15	16	17	18	19	20
11	1.00000									
12	0.64770	1.00000								
13	0.24166	0.08204	1.00000							
14	0.09959	-0.04338	0.80079	1.00000						
15	0.34306	0.44227	-0.05174	-0.05684	1.00000					
16	0.25138	0.25668	0.54235	0.55779	0.16751	1.00000				
17	0.13965	0.09268	0.49287	0.63901	0.03026	0.69008	1.00000			
18	0.36799	0.53721	-0.06459	-0.13846	0.32788	0.11038	0.04371	1.00000		
19	0.51656	0.54810	0.20295	0.17457	0.23661	0.29044	0.25571	0.28766	1.00000	
20	0.41503	0.38715	0.35483	0.26369	0.22666	0.32414	0.28096	0.19187	0.45582	1.00000
21	0.39643	0.50631	0.04565	-0.13492	0.29085	0.14114	0.08671	0.54079	0.24700	0.23237

	21
21	1.00000

EIGENVALUES

6.65866	4.64904	1.63729	1.31717	0.96742	0.82282	0.65191	0.52741	0.50322	0.43270
0.41561	0.38531	0.34649	0.32298	0.29472	0.26742	0.21208	0.18865	0.16168	0.15691
0.09045									

CUMULATIVE PROPORTION OF TOTAL VARIANCE

0.31705	0.53846	0.61643	0.67915	0.72522	0.76440	0.79544	0.82056	0.84452	0.86512
0.88444	0.90279	0.91928	0.93466	0.94870	0.96143	0.97153	0.98051	0.98821	0.99568
0.99955									

VARIABLE	ESTIMATED COMMUNALITY	FINAL COMMUNALITY
1	1.000000	0.645255
2	1.000000	0.648918
3	1.000000	0.829186
4	1.000000	0.594314
5	1.000000	0.588467
6	1.000000	0.778880
7	1.000000	0.689937
8	1.000000	0.828901
9	1.000000	0.655765
10	1.000000	0.741535
11	1.000000	0.738185
12	1.000000	0.736552
13	1.000000	0.773195
14	1.000000	0.864011
15	1.000000	0.871580
16	1.000000	0.627756
17	1.000000	0.703361
18	1.000000	0.482470
19	1.000000	0.718182
20	1.000000	0.463214
21	1.000000	0.575593

2. Repeated Principal Axes Procedure with Multiple Correlations as Communality Estimates, and Orthogonal Rotations of the Number of Factors Determined in Step 1

VARIABLE	MEAN	ST.DEV.
1	17.178391	5.672292
2	20.397064	6.739338
3	17.726947	5.831758
4	16.591415	6.079356
5	18.344269	6.279227
6	18.018463	5.415694
7	21.233017	5.503032
8	16.945679	6.874125
9	17.526550	5.652678
10	22.230972	6.127819
11	22.431351	5.355087
12	21.397095	5.392684
13	17.627777	6.233568
14	17.557007	7.120719
15	20.544708	6.655076
16	19.439545	5.571154
17	20.340302	5.878291
18	17.777618	6.038527
19	21.560989	4.806770
20	18.664169	5.368932
21	21.985992	5.606886

CORRELATION MATRIX

	1	2	3	4	5	6	7	8	9	10
1	0.48604									
2	0.45043	0.47354								
3	0.40619	0.11425	0.79471							
4	0.32123	0.09650	0.38039	0.45403						
5	0.16446	0.32417	-0.02192	0.10246	0.52680					
6	0.56032	0.23975	0.72314	0.22083	-0.01506	0.71592				
7	0.22398	0.27659	0.22546	0.06894	0.45715	0.22437	0.51428			
8	0.32198	-0.06058	0.77164	0.37919	-0.17054	0.59952	0.05534	0.81847		
9	0.37798	0.41380	0.21497	0.18371	0.54427	0.30048	0.50022	-0.00976	0.53854	
10	0.12312	0.30793	-0.07489	0.20056	0.33350	-0.10187	0.33608	-0.13990	0.29221	0.73164
11	0.22610	0.19104	0.20805	0.37473	0.21723	0.12423	0.29763	0.17616	0.27485	0.71735
12	0.25318	0.31247	0.14489	0.28589	0.40318	0.09139	0.48617	-0.00059	0.43215	0.71198
13	0.33478	-0.03834	0.74467	0.38679	-0.16577	0.59589	0.06427	0.78725	0.02648	-0.11841
14	0.35586	-0.04932	0.82062	0.28776	-0.18444	0.66059	0.08992	0.87972	0.02940	-0.23318
15	0.29095	0.44300	-0.01135	0.39422	0.28767	-0.00549	0.23085	-0.03728	0.29462	0.44815
16	0.44730	0.19217	0.64582	0.32938	0.09523	0.62856	0.29116	0.56223	0.27936	0.08051
17	0.38966	0.14709	0.64855	0.19044	0.04487	0.72117	0.28639	0.55944	0.28489	-0.07724
18	0.22847	0.28625	-0.03292	0.21184	0.39014	0.04012	0.32079	-0.11649	0.45082	0.46790
19	0.17942	0.14977	0.30819	0.20095	0.36438	0.18268	0.59115	0.17346	0.31945	0.47362
20	0.25840	0.15184	0.36221	0.43635	0.42806	0.27286	0.34514	0.20399	0.32089	0.21745
21	0.30419	0.46202	0.04338	0.16200	0.46603	0.15805	0.34511	-0.10233	0.81466	0.45839

	11	12	13	14	15	16	17	18	19	20
11	0.67386									
12	0.64770	0.67812								
13	0.24166	0.38204	0.76521							
14	0.09559	-0.04338	0.80079	0.86957						
15	0.34308	0.44227	-0.05174	-0.05684	0.48946					
16	0.25138	0.25668	0.54235	0.55779	0.16751	0.60769				
17	0.13665	0.09268	0.49287	0.63901	0.03026	0.69068	0.67716			
18	0.36799	0.53721	-0.06459	-0.13846	0.32789	0.11038	0.04371	0.44065		
19	0.51886	0.54810	0.20295	0.17457	0.23661	0.29044	0.25571	0.28766	0.56797	
20	0.41503	0.38715	0.35483	0.26369	0.22666	0.32414	0.28096	0.19187	0.45582	0.48884
21	0.39943	0.50631	0.04565	-0.13492	0.29085	0.14114	0.08671	0.54079	0.24700	0.23237

	21
21	0.56578

ITERATION FOR COMMUNALITIES

	MEAN ABS. DEV.	MAX. ABS. DEV.
1	0.0438	0.0733
2	0.0166	0.0413
3	0.0076	0.0262
4	0.0047	0.0192
5	0.0033	0.0151
6	0.0023	0.0126
7	0.0017	0.0106
8	0.0015	0.0092
9	0.0012	0.0082
10	0.0011	0.0074
11	0.0010	0.0067

EIGENVALUES

6.35653	4.39475	1.33029	0.94337	0.61806	0.46235	0.30330	0.18584	0.13319	0.09554
0.04871	0.02795	0.00854	0.00538	-0.02988	-0.03568	-0.05324	-0.07252	-0.09917	-0.10119
-0.11838									

CUMULATIVE PROPORTION OF TOTAL VARIANCE

0.30269	0.51149	0.57484	0.61976	0.64919	0.67121	0.68565	0.69450	0.70084	0.70539
0.70771	0.70904	0.70965	0.70970						

VARIABLE	ESTIMATED COMMUNALITY	FINAL COMMUNALITY
1	0.507293	0.506539
2	0.693890	0.700050
3	0.818544	0.818601
4	0.665635	0.669090
5	0.624717	0.624762
6	0.768268	0.768229
7	0.586422	0.585868
8	0.813262	0.813142
9	0.602284	0.602442
10	0.842072	0.842348
11	0.711598	0.711318
12	0.717449	0.717505
13	0.829671	0.829932
14	0.868221	0.868005
15	0.577821	0.575002
16	0.635511	0.635158
17	0.754302	0.753263
18	0.473673	0.474077
19	0.677372	0.677178
20	0.525991	0.525687
21	0.699763	0.700445

FACTOR MATRIX BEFORE ROTATION

VARIABLE	FACTOR 1	2	3	4	5	6	7
1	0.59271	0.03074	-0.27014	-0.27929	-0.02156	-0.04103	0.03405
2	0.39512	-0.36430	-0.43491	-0.31749	-0.11229	-0.16542	0.28511
3	0.72709	0.52281	-0.01347	0.08833	-0.05163	0.00597	0.07700
4	0.50424	0.00205	0.30696	-0.38891	0.38417	0.00054	-0.14752
5	0.33935	-0.54212	-0.22429	0.22958	0.32634	0.06026	0.05061
6	0.67983	0.43474	-0.30128	-0.02759	-0.14523	0.03431	-0.05720
7	0.52062	-0.33064	-0.12997	0.41227	0.02207	-0.12650	0.04635
8	0.59032	0.64600	0.19617	-0.05381	0.01617	0.02833	0.07004
9	0.53550	-0.38122	-0.36203	0.09467	0.11566	0.09844	-0.08517
10	0.37713	-0.68708	0.35460	-0.05900	-0.30622	-0.06784	-0.02109
11	0.56777	-0.37429	0.45779	-0.05145	-0.18076	0.06304	0.00056
12	0.57287	-0.56607	0.22337	0.04149	-0.12349	0.01422	-0.04270
13	0.61576	0.57224	0.21831	-0.07110	0.00831	0.22445	0.14197
14	0.59615	0.70524	0.08045	0.01503	-0.00453	-0.00831	0.09199
15	0.36235	-0.43135	0.04304	-0.36772	0.13046	-0.32178	-0.00273
16	0.70371	0.27440	-0.08977	0.00024	-0.06015	-0.12205	-0.19516
17	0.65462	0.40130	-0.24362	0.14571	-0.10048	-0.12106	-0.24158
18	0.36458	-0.52165	-0.05165	-0.06322	-0.02838	0.19152	-0.15777
19	0.57632	-0.28286	0.24509	0.40955	-0.00464	-0.15860	0.10972
20	0.58057	-0.10256	0.16024	0.12127	0.36088	0.03261	0.08017
21	0.44508	-0.52556	-0.22187	-0.11913	-0.09714	0.38307	0.04818

ORTHOGONAL ROTATION

ITERATION	SIMPLICITY CRITERION
0	-1.242088
1	-7.810476
2	-7.991650
3	-7.999740
4	-8.000540
5	-8.000699
6	-8.000746
7	-8.000785
8	-8.000828
9	-8.000841

ROTATED FACTOR MATRIX

VARIABLE	FACTOR 1	2	3	4	5	6	7
1	0.45140	0.07140	-0.44591	-0.06714	0.15211	-0.25898	-0.06423
2	0.05290	0.12934	-0.76270	-0.14714	-0.02743	-0.27468	0.03089
3	0.88738	0.04824	-0.03833	-0.15319	0.03429	0.01511	0.04989
4	0.29142	0.21126	-0.07192	-0.01600	0.72601	-0.08337	0.00778
5	-0.15069	0.10143	-0.16375	-0.63463	0.13594	-0.37902	0.00819
6	0.81545	-0.05528	-0.19415	-0.06247	-0.05724	-0.19509	-0.13143
7	0.15627	0.28225	-0.13276	-0.64725	-0.10195	-0.15507	-0.19381
8	0.85319	0.02886	0.07482	0.04469	0.19116	0.14919	0.13407
9	0.13227	0.12029	-0.26106	-0.46317	0.06421	-0.51237	-0.14542
10	-0.16694	0.85305	-0.18115	-0.14029	0.06263	-0.16827	-0.04526
11	0.16800	0.77121	-0.02861	-0.13096	0.20297	-0.15030	0.08106
12	0.04175	0.70007	-0.14278	-0.32451	0.13822	-0.28129	-0.04174
13	0.83224	0.07925	0.11258	0.05846	0.18706	-0.00534	0.28268
14	0.90395	-0.05738	0.04011	-0.00610	0.09600	0.16122	0.10360
15	-0.07605	0.34120	-0.49706	-0.13720	0.41033	-0.04359	-0.12896
16	0.69737	0.13313	-0.13128	-0.15503	0.11743	-0.08247	-0.26313
17	0.76213	-0.02299	-0.07285	-0.19499	-0.04585	-0.08164	-0.34611
18	-0.07515	0.37616	-0.13180	-0.19257	0.12848	-0.49593	-0.10010
19	0.21776	0.52241	0.00390	-0.59511	0.01141	0.04356	0.02528
20	0.29805	0.20239	-0.00094	-0.47171	0.37758	-0.10741	0.13884
21	0.00207	0.32539	-0.26546	-0.17827	0.01022	-0.69336	0.10704

FACTOR SCORE COEFFICIENTS

VARIABLE	FACTOR 1	2	3	4	5	6	7
1	0.02891	-0.02633	-0.16669	0.05529	0.04426	-0.04785	-0.02389
2	0.00360	-0.05757	-0.63533	0.01826	-0.10047	0.09600	0.23485
3	0.17620	0.00108	-0.01375	-0.10636	-0.14547	0.05068	0.09748
4	-0.02344	-0.04770	0.01945	0.05726	0.60086	-0.02763	-0.10960
5	-0.05019	-0.17072	0.04022	-0.34689	0.12458	-0.12371	0.11730
6	0.18784	-0.05415	-0.11235	0.10594	-0.16372	-0.18973	-0.16619
7	0.00272	0.00501	0.00105	-0.28844	-0.12389	0.07177	-0.02889
8	0.12565	0.02720	0.05544	0.06740	0.12551	0.06745	0.11844
9	-0.00324	-0.09493	0.01984	-0.13305	0.03451	-0.22770	-0.07535
10	-0.01790	0.60209	-0.06595	0.22397	-0.17556	0.10897	-0.09859
11	0.02680	0.23601	0.09941	0.07619	0.04314	-0.01385	0.08948
12	-0.00133	0.19805	0.06246	-0.03506	0.01415	-0.06725	-0.07558
13	0.17772	0.07848	0.15675	0.14072	0.06314	-0.16118	0.50153
14	0.23195	0.00160	-0.11466	-0.02618	-0.04363	0.21792	0.16359
15	-0.04861	0.00983	-0.27667	0.00747	0.24453	0.16421	-0.11696
16	0.07852	0.01136	-0.02253	0.00831	0.03861	0.02435	-0.30579
17	0.14038	-0.00618	0.09748	-0.04189	-0.06961	-0.04291	-0.55889
18	-0.00540	0.02434	0.07317	0.04629	0.03603	-0.20592	-0.07215
19	0.00182	0.12131	0.04775	-0.36535	-0.10422	0.24812	0.07728
20	-0.01774	-0.05379	0.04988	-0.20736	0.18092	0.03638	0.12466
21	0.01381	-0.00160	0.03158	0.09968	-0.09919	-0.51531	0.21059

ROTATED FACTOR MATRIX: Subsample A

VARIABLE	FACTOR 1	2	3	4	5	6	7	8
1	0.40050	0.05708	0.48043	0.06097	0.04339	0.17570	-0.20034	0.02070
2	-0.00843	0.14025	0.79561	0.16663	-0.00638	0.14108	-0.10504	0.06050
3	0.88505	0.07892	0.12720	0.11701	0.06440	-0.01302	-0.01676	0.06678
4	0.38523	0.17506	0.04553	-0.07423	0.26194	0.58484	-0.19222	-0.03831
5	-0.12733	0.11821	0.14337	0.61498	0.22307	0.12059	-0.31671	0.00761
6	0.76632	-0.01000	0.25707	0.09662	0.00502	-0.07083	-0.14307	0.26912
7	0.16019	0.36780	0.09305	0.66435	0.01302	-0.05764	-0.05519	0.10024
8	0.86878	0.02233	-0.09380	-0.01346	0.07043	0.10045	0.03214	-0.04274
9	0.11081	0.12972	0.27001	0.40017	0.07024	0.17200	-0.43637	0.08950
10	-0.19932	0.83961	0.15230	0.10019	-0.01041	0.18057	-0.16729	0.02058
11	0.17233	0.82068	0.04647	0.01480	0.18993	0.11431	-0.16612	0.01694
12	0.08964	0.71848	0.10104	0.28557	-0.00138	0.20077	-0.20367	-0.01265
13	0.84814	0.09639	-0.10884	-0.14925	0.21143	0.00870	-0.05969	-0.12090
14	0.94123	-0.04458	-0.00965	0.03517	0.02658	0.02215	0.18730	-0.00451
15	-0.07942	0.28991	0.34800	0.18053	-0.00442	0.62918	0.00467	0.06470
16	0.67420	0.15960	0.04822	0.16276	-0.01257	0.24525	-0.16545	0.32402
17	0.65003	-0.01914	0.15931	0.19669	0.03467	0.02377	-0.04014	0.61033
18	-0.07356	0.36808	0.14439	0.25058	-0.06965	0.16881	-0.40755	0.00713
19	0.21829	0.64213	-0.01966	0.45088	0.11961	-0.05866	0.09666	-0.01267
20	0.33723	0.23619	0.01622	0.36258	0.70207	0.17497	-0.05374	0.02422
21	0.01883	0.34285	0.32861	0.15865	0.09971	-0.04403	-0.63998	0.03535

2.ROTATED FACTOR MATRIX: Subsample B

VARIABLE	FACTOR 1	2	3	4	5	6	7
1	0.48597	-0.09069	0.06609	-0.47391	-0.15215	0.18514	-0.22132
2	0.06280	-0.16670	0.12643	-0.70928	-0.05778	0.26484	0.05545
3	0.88228	-0.17898	0.02035	0.01913	0.05393	-0.04387	0.03720
4	0.22335	-0.03974	0.20359	-0.03588	0.77263	0.04327	0.00140
5	-0.18310	-0.61843	0.10332	-0.17152	0.11224	0.42456	0.07867
6	0.80006	-0.06221	-0.09233	-0.21978	-0.05838	0.14861	-0.19414
7	0.12743	-0.63884	0.20961	-0.16843	-0.07091	0.23287	-0.07235
8	0.84799	0.10339	0.03430	0.05911	0.20391	-0.15791	0.01751
9	0.13056	-0.46100	0.10217	-0.23249	-0.01604	0.57988	-0.16081
10	-0.14502	-0.17990	0.86268	-0.16655	0.02357	0.18840	0.00860
11	0.15173	-0.16645	0.75269	-0.04228	0.24864	0.13660	0.04213
12	-0.00386	-0.37113	0.65619	-0.16732	0.15589	0.28216	-0.05871
13	0.84978	0.04807	0.06204	0.02031	0.19070	-0.02348	0.22603
14	0.89794	0.03918	-0.06785	0.06279	0.12165	-0.10988	0.12715
15	-0.07312	-0.12680	0.35259	-0.50677	0.58954	0.09050	-0.06183
16	0.72509	-0.18308	0.08532	-0.18909	0.04177	0.00856	-0.22071
17	0.78138	-0.20257	-0.01023	0.01529	-0.07866	0.09154	-0.28261
18	-0.08345	-0.17571	0.36405	-0.07723	0.15377	0.54644	-0.10785
19	0.21437	-0.67586	0.40675	-0.01354	0.11628	0.01522	-0.03857
20	0.23924	-0.42398	0.19905	-0.04322	0.37709	0.13551	0.06729
21	-0.05663	-0.18809	0.30933	-0.31392	0.00969	0.69279	0.14755

3. MATRIX OF COEFFICIENTS OF CONGRUENCE
USING NEW CONGRUENCE PROGRAM

8 FACTORS IN FIRST SAMPLE: A
7 FACTORS IN SECOND SAMPLE: B
21 VARIABLES IN EACH

	1	2	3	4	5	6	7
1	0.991	-0.214	0.076	-0.123	0.377	0.011	-0.059
2	0.117	-0.683	0.983	-0.435	0.443	0.556	-0.061
3	0.202	-0.438	0.371	-0.950	0.162	0.661	-0.311
4	0.173	-0.966	0.482	-0.502	0.191	0.699	-0.292
5	0.311	-0.487	0.317	-0.131	0.650	0.251	0.230
6	0.176	-0.318	0.526	-0.560	0.822	0.340	-0.197
7	-0.094	0.535	-0.544	0.630	-0.280	-0.946	0.230
8	0.485	-0.328	0.067	-0.281	-0.095	0.241	-0.708

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APPENDIX S

DATA FROM THE CLUSTER ANALYSIS OF THE 21 VAPP-2 SCALES

1. Record of Mergers Occurring at Every Stage in the Hierarchical Clustering Process

2. Matrices of Intercorrelations Among Two Sets of VAPP Scale Clusters

(2)

CORRELATION MATRIX: Nine VAPP Clusters

	1	2	3	4	5	6	7	8	9
1	1.00000								
2	0.21809	1.00000							
3	0.73564	0.11177	1.00000						
4	0.18593	0.54933	0.32400	1.00000					
5	-0.05779	0.41485	0.20258	0.52415	1.00000				
6	-0.08730	0.58381	0.12073	0.38653	0.58779	1.00000			
7	0.19664	0.31238	0.41826	0.27770	0.42679	0.43755	1.00000		
8	0.41830	0.40349	0.35948	0.33592	0.32856	0.26298	0.29730	1.00000	
9	-0.04029	0.46020	0.07284	0.26063	0.32815	0.34972	0.43721	0.37446	1.00000

CORRELATION MATRIX: Six VAPP Clusters

	1	2	3	4	5	6
1	1.00000					
2	0.05770	1.00000				
3	0.58381	-0.00813	1.00000			
4	0.40349	0.42185	0.26298	1.00000		
5	0.54595	0.16364	0.56435	0.37945	1.00000	
6	0.43156	0.21716	0.47141	0.36772	0.44552	1.00000

APPENDIX T

RELATIONSHIPS AMONG PRODUCTS AND WORK UNITS IN THE INDIVIDUALIZED VOCATIONAL INFORMATION SYSTEM

Excerpt from: Cunningham, J. W. The Development of a Research-Based Individualized Vocational Information System for Use in Guidance. Proposal submitted to the U. S. Office of Education, Center for Occupational Education, North Carolina State University, November, 1974.

V. RESULTS

As noted earlier, the project objectives and plans call for the development of an Individualized Vocational Information (IVI) System for use in guidance in grades 8 through 11. The completed IVI System would provide the student with vocational information related to his/her particular interests as measured by the Vocational Activity Preference Profile (VAPP). The system would provide the student with information on a broad, general (cluster) basis or at a focused, detailed level, depending upon his/her needs and stage of vocational development. (Most students would enter the system at the cluster level and later narrow their search to specific occupations and jobs.) It would provide LEA's with a systematic procedure for analyzing jobs, occupations, and vocational/technical (and other occupational) programs of special interest, for the purpose of incorporating them into the system; it would also provide LEA's with a framework for organizing their particular sources of information (booklets, catalogs, files, brochures), thereby incorporating them into the system. Moreover, because the major components of the IVI System are not specific to particular locality or regions and because it is designed to be incorporated into a variety of guidance programs, the completed system should be easily transportable to different LEA's; it should have nationwide applicability. Although the completed IVI System would be directed toward grades 8-11, it could later be expanded to grade levels above or below this range.

Figure 2 depicts the relationships among the work units and final products in the proposed project. The specific products are

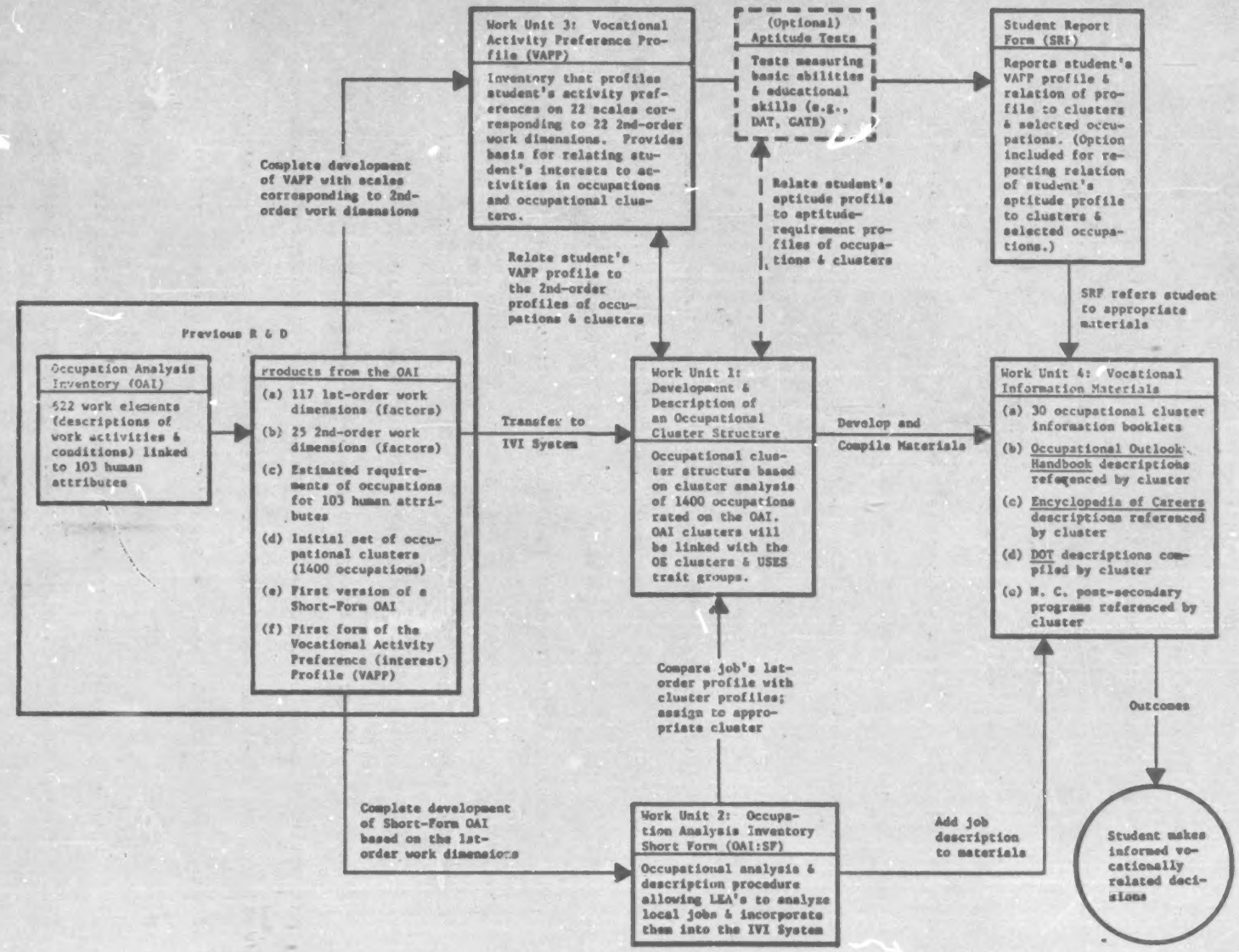
Work Unit 3: Vocational Activity Preference Profile (VAPP)
Inventory that profiles student's activity preferences on 22 scales corresponding to 22 2nd-order work dimensions. Provides basis for relating student's interests to activities in occupations and occupational clusters.
(Optional) Aptitude Tests
Tests measuring basic abilities & educational skills (e.g., DAT, GATB)
Student Report Form (SRF)
Reports student's VAPP profile & relation of profile to clusters & selected occupations. (Option included for reporting relation of student's aptitude profile to clusters & selected occupations.)
Complete development of VAPP with scales corresponding to 2nd-order work dimensions
Relate student's aptitude profile to aptitude-requirement profiles of occupations & clusters
Relate student's VAPP profile to the 2nd-order profiles of occupations & clusters
SRF refers student to appropriate materials
Previous R & D
Occupation Analysis Inventory (OAI)
622 work elements (descriptions of work activities & conditions) linked to 103 human attributes
Products from the OAI
(a) 117 1st-order work dimensions (factors)
(b) 25 2nd-order work dimensions (factors)
(c) Estimated requirements of occupations for 103 human attributes
(d) Initial set of occupational clusters (1400 occupations)
(e) First version of a Short-Form OAI
(f) First form of the Vocational Activity Preference (interest) Profile (VAPP)
Transfer to IVI System
Work Unit 1: Development & Description of an Occupational Cluster Structure
Occupational cluster structure based on cluster analysis of 1400 occupations rated on the OAI. OAI clusters will be linked with the OE clusters & USES trait groups.
Develop and Compile Materials
Work Unit 4: Vocational Information Materials
(a) 30 occupational cluster information booklets
(b) Occupational Outlook Handbook descriptions referenced by cluster
(c) Encyclopedia of Careers descriptions referenced by cluster
(d) DOT descriptions compiled by cluster
(e) M. C. post-secondary programs referenced by cluster
Compare job's 1st-order profile with cluster profiles; assign to appropriate cluster
Outcomes
Complete development of Short-Form OAI based on the 1st-order work dimensions
Work Unit 2: Occupation Analysis Inventory Short Form (OAI:SF)
Occupational analysis & description procedure allowing LEA's to analyze local jobs & incorporate them into the IVI System
Add job description to materials
Student makes informed vocationally related decisions

Figure 2

Relationships Among Products and Work Units in the IVI (Individualized Vocational Information) System

summarized below. (Complete descriptions of the products were presented in the preceding Plan Section.)

(a) Occupational Cluster Structure. The completed occupational cluster structure will consist of groups of occupations with similar work-dimension profiles. It is anticipated that there will be a set of approximately 25-30 broad (macro) clusters which, in turn, will subsume varying numbers of more specific (micro) clusters (perhaps a total of 90 to 100). The resultant cluster structure will be linked to the 15 Office of Education categories and the 22 work areas and 114 worker trait groups of the U. S. Employment Service. (The micro clusters will probably be subsumed under the broad OE and USES categories and will probably be directly related to at least some of the worker trait groups.) The cluster system will incorporate the occupational titles (and descriptions) in the Occupational Outlook Handbook and Encyclopedia of Careers and will include representative samples of the titles and descriptions in the Dictionary of Occupational Titles. Work-dimension and attribute-requirement profiles will be derived for the occupations and clusters in the system. (This includes the original 1400 occupations and the clusters based on them, but not all of the occupations in the Handbook, Encyclopedia, and DOT.)

(b) The Vocational Activity Preference Profile (VAPP). The VAPP will measure the student's activity preferences on 22 scales corresponding to the second-order OAI work dimensions (factors). This instrument, containing approximately 250 items, will provide a basis for relating a student's vocational interests to the characteristics of various occupations and clusters in the IVI System. Students will be referred to appropriate vocational information on the basis of these relationships.

(c) Short Form of the Occupation Analysis Inventory (OAI-SF). The OAI-SF will contain approximately 220 "work elements" on which jobs, occupations, and vocational/technical programs can be analyzed (i.e., rated). Computer processing of the OAI-SF ratings will yield a work-dimension and attribute-requirement profile for the job in question, as well as a cluster assignment. The results will be presented on a computerized report form and returned to the user. Based on these results, jobs, occupations, and programs of special interest to an LEA can be incorporated into the IVI System. (The OAI-SF might also be developed for use in comparative analyses among vocational/technical education programs and between programs and occupations.)

(d) Vocational Information Materials. Approximately 30 occupational cluster information booklets will be developed describing, in interesting and digestible form, the activities, requirements, and conditions associated with occupations in particular clusters. A cluster booklet will also list occupations associated with the cluster in question and reference appropriate occupational descriptions and page numbers in the Occupational Outlook Handbook and Encyclopedia of Careers. Suggestions will be offered on how the student can learn more about the occupations in a particular cluster. In addition, a file will be constructed containing a representative sample of DOT descriptions for each occupational cluster, and a list of post-secondary educational programs in the State of North Carolina will be compiled for each cluster. By assigning their specific sources of vocational information (booklets, films, brochures, catalogs) to the appropriate clusters, LEA's will be able to incorporate these materials into the IVI System.

(e) Student Report Form (SRF). The SRF will present the student's VAPP scale profile along with estimates of correspondence between his/her profile and the work-dimension profiles of the various occupational clusters in the IVI structure. (A provision may also be included for presenting estimates of correspondence between the student's VAPP profile and the profiles for a few specific occupations selected by the student.) Based on these correspondence estimates, the SRF will suggest what cluster booklets the student might be interested in reading. An optional SRF will be developed which will also include estimates of correspondence between the student's aptitude test profile and the aptitude requirements associated with the various occupational clusters.

(f) Counselor/Teacher's Handbook and User's Manual. The Counselor/Teacher's Handbook will contain a summary description of the IVI System and how it was developed (in laymen's terms). The cluster structure and all of the related instruments and materials will be described. The User's Manual will describe how to administer the VAPP, interpret the Student Report Form, and refer the student to appropriate vocational materials. Complete descriptions of all VAPP scales will be included. Suggestions will be offered on how to help the student get the most from the vocational information materials in the IVI System.

(g) Field Test Design. Although certain components of the IVI System will be tested during the proposed project (i.e., the VAPP and OAI-SF), a field test of the complete system is not possible under the prescribed time and monetary constraints. A field test of the IVI

System will be designed, however, in consultation with Dr. [name omitted]. This field test would involve a tryout of the IVI System in one or more North Carolina public school systems and an evaluation of the results. At the end of the proposed project, additional funding would be sought to field test the IVI System in collaboration with the North Carolina Department of Public Instruction. In addition, the IVI System would be made available to others for field testing purposes.

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Report No. 15. Cunningham, J. W., D. F. Slonaker, and N. B. Riegel. **The Development of Interest Scales Based on Systematically Derived Work Dimensions: A Pilot Study,** 1975.

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Report No. 17. Boese R. R. and J. W. Cunningham. **Relationships Between the Occupation Analysis Inventory, the Ohio Vocational Interest Survey, and the USES Worker Trait Groups: An Exploratory Study,** in press.

Report No. 18. Parry-Hill, J. W., Jr. and J. W. Cunningham. **The Initial Development and Validation of a Short Form Occupation Analysis Inventory Based on Systematically Derived Work Dimensions,** in press.

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